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SUCCESSIVE INTEGRATION AS A METHOD FOR FINDING LONG PERIOD CYCLES

By

RALPH W. POWELL, C.E.*

SYNOPSIS

A method is developed for finding the period of cycles in statistical data of longer period than can be found by ordinary periodogram method. It consists of computing the progressive summations of the deviations of the observed data from normal. (As a first approximation normal is taken as the mean of the observed data.) Then the progressive summations of these accumulated discrepancies are found, and so on to the third or fourth integration. This process rapidly "irons out" all chance and short period variations and leaves a smooth cycle whose approximate period is obvious. The objection that this is but an extension of the "quadrature" method, which makes cycles appear in data where none are present, is discussed and methods are presented for determining whether the cycle found is real or fictitious.

SUCCESSIVE INTEGRATION AS A METHOD FOR FINDING LONG PERIOD CYCLES

The question of the search for hidden periodicities in statistical data is important for the civil engineer interested in stream flow, the meteorologist and agriculturist interested in rainfall or temperature, the business statistician and probably many others. The ordinary method of periodogram analysis as developed by Schuster[1] and discussed by Whittaker and Robinson[2] requires a period of record several times as long as the longest cycle considered. A century's record of annual rainfall at any given station or group of stations will enable us to test for the presence of cycles with periods of say from eight to twenty years, and possibly even to 33 or 50 years, but could not reveal a cycle of period of say between fifty and one hundred fifty years if

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1. Proc. Roy. Soc. 77 (1906) p. 136.
2. The Calculus of Observations, Chap. XIII, pp. 343-362.

one were present. For the latter purpose the following method has been developed.

Suppose the given data is of the form $y = a + b \cos \frac{k(x-c)}{p} \pm d$ where

y = any value of the dependent variable, as for example, the total inches of rainfall at a given station in any given year.

a = a constant, the normal value about which y fluctuates, as the normal rainfall in inches per year for the given station. If the data contains a straight line trend this term would be replaced by $(a + mx)$, where m measures the rate or slope of the trend.

b = a constant, the amplitude of the cycle.

k = 360, to give the angle in degrees, or 2π, to give the angle in radians.

x = the independent variable or serial number of the particular value y, as for example the date A. D. of the year whose rainfall is y.

c = a constant specifying the phase of the cycle, as for example the earliest date A. D. when the rainfall is known to have been a maximum.

p = the period of the cycle (in years, in this example).

d = a variable—the deviation of each observed value from the value given by the rest of the equation. This term takes care of all variations due to cycles of other periods, or to the form of this cycle not being that of the cosine curve, or the other variations which for want of further knowledge we must consider to be purely fortuitous.

If we subtract a, the normal value, from each of these values and take the progressive totals or first integral of the differences, we get a series of the form $\frac{bp}{2\pi} \sin \frac{k(x-c)}{p} + \Sigma d$ or $\frac{bp}{2\pi} \cos \frac{k(x-c-p/4)}{p} + \Sigma d$

The term Σd will in general be small, since the plus chance variations tend to balance the minus, as do the variations due to short period cycles which may be present. The second integration will give a series of the form $-b\left(\frac{p}{2\pi}\right)^2 \cos \frac{k(x-c)}{p}$ or $b\left(\frac{p}{2\pi}\right)^2 \cos \frac{k(x-c-p/2)}{p}$ if we neglect the sums of the Σd terms, which will, of course, tend to cancel out. The third integral will be of the form $b\left(\frac{p}{2\pi}\right)^3 \cos \frac{k(x-c-3p/4)}{p}$

and the fourth integral of the form $b\left(\frac{\rho}{2\pi}\right)^4 \cos \frac{k(x-c-\rho)}{\rho}$. That is, each integration gives a cycle of the same period as existed in the original data, but advanced a quarter period in phase and with the amplitude multiplied by $\frac{\rho}{2\pi}$.

The way in which this method "irons out" chance variations and short period fluctuations is most amazing to one who has not tried it. Table I and Plate I illustrate the method as applied to the annual rainfall at Boston, Mass., for the years 1818-1928. Although this has been carried to the third integration to illustrate the method, it was unnecessary in this case, as the second integration gives a smooth curve. The first integration changed from minus to plus in 1865 (fractions of a year being neglected) and from plus to minus in 1912, giving a half period of 47 years. But by producing the first integration curve backward we see that it would pass through zero in 1814, which gives a whole period of 98 years. As a compromise, 96 years was taken as the value of ρ.

The Weather Bureau gives the rainfall to the hundredth of an inch, but it was found that the results were practically the same if the rainfall were taken to the nearest inch, which was done in this table. The mean rainfall for the 111 years was 43.45 and there seems to be no trend. (From *a priori* grounds, such as the relative constancy of flora, lake levels, etc., we are quite sure that the rainfall of New England has changed very slightly in the last few centuries, so that for a period of only 111 years we can assume the normal rainfall as constant. The matter could also be tested statistically by fitting a straight line to the data by least squares, but this was not done.) But the normal rainfall is not necessarily equal to the mean for the period. In fact, a preliminary trial indicated that the period of the most important cycle was a little less than 100 years, and that of the 111 years the portion in excess of a full cycle was below normal, therefore that the observed mean would be below normal. So 44 inches per year was taken as the first approximation to normal.

A second point in Table I which needs explanation is the initial value in each of the summation columns. A preliminary computation was made starting from zero. This was found to give a series of numbers averaging quite a little above zero. But the average of these values cannot be taken as their normal any more than in the case of the observed rainfall themselves. Averaging the maximum and minimum values gave + 46, therefore it was assumed that all values should be reduced 46 (accumulated inches) and a second trial was made using –46 as the value of the first integration for 1817. When the

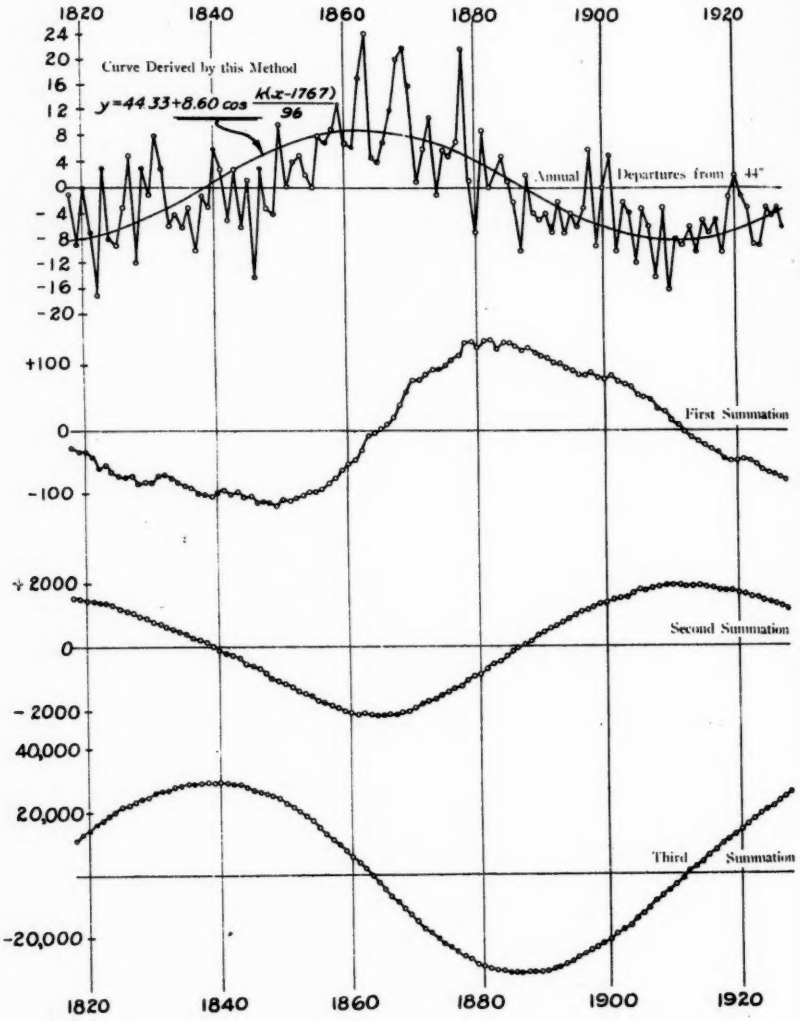
TABLE I

Search for a Long Period Cycle in the Precipitation Records of Boston, Mass.

Year	Inches of Rainfall	Excess or Deficiency From 44"	Summations		
			First	Second	Third
			− 26	1580	10400
1818	43	− 1	− 27	1553	11953
1819	35	− 9	− 36	1517	13470
1820	44	0	− 36	1481	14951
1821	37	− 7	− 43	1438	16389
1822	27	−17	− 60	1378	17767
1823	47	3	− 57	1321	19088
1824	36	− 8	− 65	1256	20344
1825	35	− 9	− 74	1182	21526
1826	41	− 3	− 77	1105	21526
1827	49	5	− 72	1033	23664
1828	32	−12	− 84	949	24613
1829	47	3	− 81	868	25481
1830	43	− 1	− 82	786	26267
1831	52	8	− 74	712	26979
1832	47	3	− 71	641	27620
1833	38	− 6	− 77	564	28184
1834	40	− 4	− 81	483	28667
1835	38	− 6	− 87	396	29063
1836	41	− 3	− 90	306	29369
1837	34	−10	− 100	206	29575
1838	43	− 1	− 101	105	29680
1839	41	− 3	− 104	1	29681
1840	49	5	− 99	− 98	29583
1841	47	3	− 96	− 194	29389
1842	39	− 5	− 101	− 295	29094
1843	47	3	− 98	− 393	28701
1844	38	− 6	− 104	− 497	28204
1845	46	2	− 102	− 599	27605
1846	30	−14	− 116	− 715	26890
1847	47	3	− 113	− 828	26062
1848	41	− 3	− 116	− 944	25118
1849	40	− 4	− 120	−1064	24054
1850	54	10	− 110	−1174	22880
1851	44	0	− 110	−1284	21596
1852	48	4	− 106	−1390	20206
1853	49	5	− 101	−1491	18715
1854	46	2	− 99	−1590	17125
1855	44	0	− 99	−1689	15436
1856	52	8	− 91	−1780	13656
1857	51	7	− 84	−1864	11792
1858	53	9	− 75	−1939	9853
1859	57	13	− 62	−2001	7852
1860	51	7	− 55	−2056	5796
1861	50	6	− 49	−2105	3691
1862	61	17	− 32	−2137	1554
1863	68	24	− 8	−2145	− 591
1864	49	5	− 3	−2148	− 2739
1865	48	4	1	−2147	− 4886
1866	51	7	8	−2139	− 7025
1867	56	12	20	−2119	− 9144
1868	64	20	40	−2079	−11223
1869	66	22	62	−2017	−13240
1870	60	16	78	−1939	−15179
1871	45	1	79	−1860	−17039

Year	Inches of Rainfall	Excess or Deficiency From 44"	Summations		
			First	Second	Third
1872	50	6	85	–1775	–18814
1873	55	11	96	–1679	–20493
1874	43	– 1	95	–1584	–22077
1875	50	6	101	–1483	–23560
1876	49	5	106	–1377	–24937
1877	51	7	113	–1264	–26201
1878	66	22	135	–1129	–27330
1879	45	1	136	– 993	–28323
1880	37	– 7	129	– 864	–29187
1881	53	9	138	– 726	–29913
1882	44	0	138	– 588	–30501
1883	35	– 9	129	– 459	–30960
1884	49	5	134	– 325	–31285
1885	45	1	135	– 190	–31475
1886	42	– 2	133	– 57	–31532
1887	34	–10	123	66	–31466
1888	46	2	125	191	–31275
1889	40	– 4	121	312	–30963
1890	39	– 5	116	428	–30535
1891	40	– 4	112	540	–29995
1892	37	– 7	105	645	–29350
1893	42	– 2	103	748	–28602
1894	37	– 7	96	844	–27758
1895	40	– 4	92	936	–26822
1896	38	– 6	86	1022	–25800
1897	41	– 3	83	1105	–24695
1898	50	6	89	1194	–23501
1899	35	– 9	80	1274	–22227
1900	44	0	80	1354	–20873
1901	49	5	85	1439	–19434
1902	34	–10	75	1514	–17920
1903	42	– 2	73	1587	–16333
1904	40	– 4	69	1656	–14677
1905	32	–12	57	1713	–12964
1906	41	– 3	54	1767	–11197
1907	38	– 6	48	1815	– 9382
1908	30	–14	34	1849	– 7533
1909	41	– 3	31	1880	– 5653
1910	28	–16	15	1895	– 3758
1911	36	– 8	7	1902	– 1856
1912	35	– 9	– 2	1900	44
1913	38	– 6	– 8	1892	1936
1914	34	–10	– 18	1874	3810
1915	39	– 5	– 23	1851	5661
1916	37	– 7	– 30	1821	7482
1917	39	– 5	– 35	1786	9268
1918	34	–10	– 45	1741	11009
1919	43	– 1	– 46	1695	12704
1920	46	2	– 44	1651	14355
1921	43	– 1	– 45	1606	15961
1922	41	– 3	– 48	1558	17519
1923	35	– 9	– 57	1501	19020
1924	35	– 9	– 66	1435	20455
1925	41	– 3	– 69	1366	21821
1926	40	– 4	– 73	1293	23114
1927	41	– 3	– 76	1217	24331
1928	38	– 6	– 82	1135	25466

PLATE I



Long Period Cycle of Rainfall Variation at Boston, Mass.

second integration was made from these figures it was found that the curve had a general downward slope, and from its slope a correction was estimated for the initial term of the first integration. The initial terms of the other columns were found in a similar manner. The values given are the result of several successive approximations. It is probable that by using a different combination of values for these initial numbers an equally good cycle of a slightly different period might be developed. It is claimed only that this is a method of finding the *approximate* period of long cycles. If the exact period were important we could, by least square methods, fit cycles of periods slightly less and slightly greater than that found, and see which gave the best fit.

The minimum value of the second summation was −2148 in 1864 and the maximum was +1902 in 1911. Therefore the double amplitude was 4050 and the single amplitude was 2025. Therefore $b\left(\frac{p}{2\pi}\right)^2 = 2025$ and $b = \frac{2025 \times 4\pi^2}{96^2} = 8.67$. A similar use of the values of the third integration gave an amplitude of $\frac{29681 + 31532}{2} = 30606.5$ and $b = \frac{30606.5 \times 8\pi^3}{96^3} = 8.60$.

As shown above the maxima of the second integration occur at about 1815 and 1911, therefore maxima of the rainfall itself should have occurred in 1767 and 1863 and c may be taken as 1767. Values of the term $8.60 \cos \frac{k(x-1767)}{96}$ were computed for each year. The first 96 terms will, of course, add to zero, but the last 15 terms add to −98.35, so that this will shift the 111-year average 0.89 inches below normal. As the average of the original data was 43.45, this indicates that the normal should be $43.45 + 0.89 = 44.34$ and our equation becomes $y = 44.34 + 8.52 \cos \frac{k(x-1767)}{96} \pm d$.*

* It is not claimed that this equation as it stands can be used to forecast rainfalls at Boston. The data when examined by the periodogram method reveal several cycles of shorter periods, and even when corresponding terms are added to the formula the fortuitous variations average several inches per year. After this computation was made I found that C. F. Marvin had discussed this particular case (Monthly Weather Review, Aug., 1923, Vol. 51, pp. 383-390, "Concerning Normals, Secular Trends and Climatic Changes). By using data for Boston running back to 1750 (some actual and some "manufactured") he finds that straight line trends, rather than a cosine curve, best fit the data. He finds a normal annual rainfall of 40.06 from 1759 to 1849 and of 44.71 from 1849 to 1904, at which date the normal suddenly dropped again. The average rainfall from 1904 to 1928 inclusive was 37.80. Taking this as the normal for that period and the normals for the other two periods as given by Marvin, the average deviation from the normal for the 111 years was 5.46. The average deviation from the mean for the 111 years was 6.36. The average deviation from the formula derived above was 4.65. Adding four shorter cycles, we get the formula:

It will probably be urged against this method that the process of progressive summation often gives very misleading results, as has been pointed out by Bullock, Persons and Crum[1] and Simon Kuznets[2]. The latter gives, for example, 50 digits drawn at random, and the progressive totals of the deviations from the average, from which he deduces a pseudo cycle. Plate II shows that an even more striking cycle can be derived from this same random data by getting the second and third integrations. By following the same method as outlined above, a curve was deduced and drawn. The original data fit this curve with a mean deviation of 2.40, while they fit the average line with a mean deviation of 2.48. It may be urged that the cycle derived from the rainfall data is no more real than that derived from the chance data. But actually the cases are quite different, as we will proceed to show.

The test as to whether a time series contains cycles has been developed by Goutereau[3], Besson[4] and Woolard[5]. If the absolute values of the successive first differences of the series are averaged, this average is called the mean variability. The average of the absolue values of the differences of each value from the mean of all the values is called the mean deviation. Goutereau's Ratio, G, equals mean variation divided by mean deviation. For a random series of numbers whose distribution is Gaussian, the expected value of G will be $\sqrt{2}$. But if there is a cycle present, even if concealed by large chance varia-

---

$$y = 44.22 + 8.60 \cos \frac{k(x-1767)}{96} + 2.58 \cos \frac{k(x-1773)}{47}$$

$$+ 2.70 \cos \frac{k(x-1798)}{34} + 2.56 \cos \frac{k(x-1811)}{18} + 1.88 \cos \frac{k(x-1810)}{10}$$

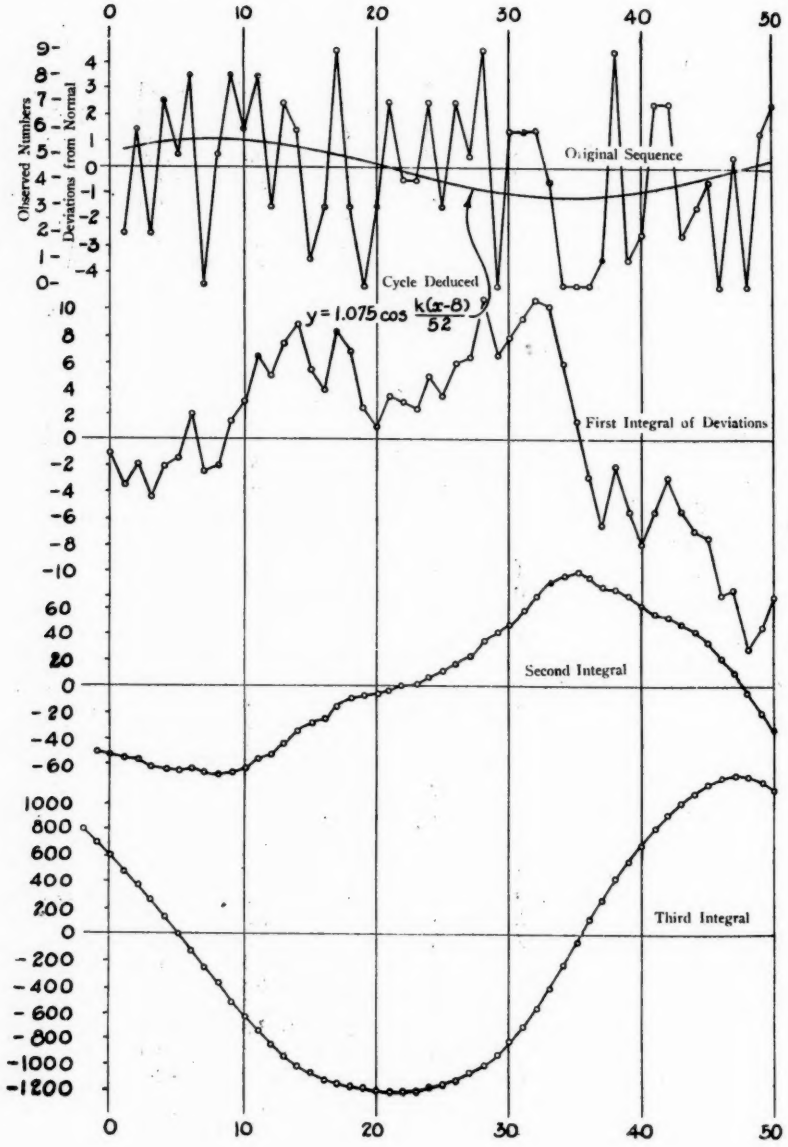
which gives an average deviation of 4.28. (Some of these figures were obtained by using the annual rainfall to the nearest inch and would be slightly different if the data to hundredths of an inch were used.) The reality of the four shorter cycles is very doubtful, but they produce a curve which fits the data much closer than the straight mean, or than Marvin's proposed normals, and somewhat closer than the simple 96 year cycle.

1. "A Reply to Karl Karsten's 'The Harvard Business Indexes—a New Interpretation'," Review of Economic Statistics, April, 1927, pp. 74-92.
2. "Random Events and Cyclical Oscillations," Journ. of the Amer. Statistical Assn., Sept., 1919, pp. 258-275.
3. Sur la variabilite de la temperature, Annuaire de la Soc. Met. de France, 54, 122-127. 1906. Summarized by Edgar W. Wooland in Minthly Weather Review. Vol. 49 (1921), pp. 132-3.
4. "On the Comparison of Meteorological Data with Results of Chance," (Tran - lated by E. W. Woolard) Monthly Weather Review, Vol. 48 (1920), pp. 89-94.
5. Edgar W. Woolard, "On the Mean Variability in Random Series," Monthly Weather Review (1925), pp. 107-111.

TABLE II

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
								– 65.0
							94.0	29.0
						–24.5	69.5	98.5
1	2	0	2		– 2.3	–26.8	42.7	141.2
2	6	1	7	5	2.7	–24.1	18.6	159.8
3	2	2	4	– 3	– 0.3	–24.4	– 5.8	154.0
4	7	3	10	6	5.7	–18.7	–24.5	129.5
5	5	3	8	– 2	3.7	–15.0	–39.5	90.0
6	8	4	12	4	7.7	– 7.3	–46.8	43.2
7	0	4	4	– 8	– 0.3	– 7.6	–54.4	– 11.2
8	5	4	9	5	4.7	– 2.9	–57.3	– 68.5
9	8	3	11	2	6.7	3.8	–53.5	–122.0
10	6	3	9	– 2	4.7	8.5	–45.0	–167.0
11	8	2	10	1	5.7	14.2	–30.8	–197.8
12	3	1	4	– 6	– 0.3	13.9	–16.9	–214.7
13	7	0	7	3	2.7	16.6	– 0.3	–215.0
14	6	– 1	5	– 2	0.7	17.3	17.0	–198.0
15	1	– 2	– 1	– 6	– 5.3	12.0	29.0	–169.0
16	3	– 3	0	1	– 4.3	7.7	36.7	–132.3
17	9	– 3	6	6	1.7	9.4	46.1	– 86.2
18	3	– 4	– 1	– 7	– 5.3	4.1	50.2	– 36.0
19	0	– 4	– 4	– 3	– 8.3	– 4.2	46.0	10.0
20	3	– 4	– 1	3	– 5.3	– 9.5	36.5	46.5
21	7	– 3	4	5	– 0.3	– 9.8	26.7	73.2
22	4	– 3	1	– 3	– 3.3	–13.1	13.6	96.8
23	4	– 2	2	1	– 2.3	–15.4	– 1.8	95.0
24	7	– 1	6	4	1.7	–13.7	–15.5	79.5
25	3	0	3	– 3	– 1.3	–15.0	–30.5	49.0
26	7	1	8	5	3.7	–11.3	–41.8	7.2
27	5	2	7	– 1	2.7	– 8.6	–50.4	– 43.2
28	9	3	12	5	7.7	– 0.9	–51.3	– 94.5
29	0	3	3	– 9	– 1.3	– 2.2	–53.5	–148.0
30	6	4	10	7	5.7	3.5	–50.0	–198.0
31	6	4	10	0	5.7	9.2	–40.8	–238.8
32	6	4	10	0	5.7	14.9	–25.9	–264.7
33	4	3	7	– 3	2.7	17.6	– 8.3	–273.0
34	0	3	3	– 4	– 1.3	16.3	8.0	–265.0
35	0	2	2	– 1	– 2.3	14.0	22.0	–243.0
36	0	1	1	– 1	– 3.3	10.7	32.7	–210.3
37	1	0	1	0	– 3.3	7.4	40.1	–170.2
38	9	– 1	8	7	3.7	11.1	51.2	–119.0
39	1	– 2	– 1	– 9	– 5.3	5.8	57.0	– 62.0
40	2	– 3	– 1	0	– 5.3	0.5	57.5	– 4.5
41	7	– 3	4	5	– 0.3	0.2	57.7	53.2
42	7	– 4	3	– 1	– 1.3	– 1.1	56.6	109.8
43	2	– 4	– 2	– 3	– 6.3	– 7.4	49.2	159.0
44	3	– 4	– 1	– 1	– 5.3	–12.7	36.5	195.5
45	4	– 3	1	2	– 3.3	–16.0	20.5	216.0
46	0	– 3	– 3	– 4	– 7.3	–23.3	– 2.8	213.2
47	5	– 2	3	6	– 1.3	–24.6	–27.4	185.8
48	0	– 1	– 1	– 4	– 5.3	–29.9	–57.3	128.5
49	6	0	6	7	1.7	–28.2	–85.5	43.0
50	7	1	8	2	3.7	–24.5	–110.0	– 67.0
Sums				92	91.4			
	214			–86	–91.4			
Sum of absolute values				178	182.8			

PLATE II



Showing How Apparent Cycles May Be Generated by Random Data.

tions superimposed on the cycle, the mean variation will be smaller than otherwise, and G will be less than 1.41. If the distribution is not Gaussian, the expected value of G will no longer be $\sqrt{2}$, but it will still be true that the presence of cycles will make G less than the expected value. Woodard, in the reference cited, gives a method for computing the expected value of G for a random order with any sort of distribution.

For the example of 50 random numbers used in Plate II, the mean deviation was 2.48 and the average variation was 3.45, making $G = 1.39$. The expected average deviation of numbers drawn from a universe containing equal numbers of each of the digits from 0 to 9 is 2.50 and the expected deviation by Woolard's method is 3.30, making the expected value of $G = 1.32$[1]. In the data for Boston rainfall, given in Table I, the mean deviation was 6.356 and the mean variability 6.54, or $G = 1.03$, while Woolard's method would give an expected value of 1.38 ± 0.11 for random succession. The distribution of the "universe" of which this is a sample is not Gaussian, but it is not *much* different from Gaussian, so that the true value of G is not far from 1.41. An investigation of a much larger sample of rainfall data, which the writer hopes to publish soon, gives $G = 1.386 \pm .027$. It is therefore quite certain that the departure of the value of G from the expected value for random numbers is not accidental but indicates that we have here a real cycle, while in the case of drawn numbers we had only an apparent one.

To test the operation of the method in a case where it was known that there were both chance and cyclic elements present, Table II was prepared. The first two columns give the same random numbers from which Plate II was plotted. Column (3) is an artificial cycle which approximates a sine curve of period 24 and amplitude 4.00. Column (4) gives the algebraic sum of (2) and (3), and column (5) the first differences of column (4). Column (6) gives the deviations of the values in column (4) from the mean (4.30). Columns (7), (8)

1. The sample of 50 drawings gave by Woolard's method an expected mean variation for random succession of $3.27 \pm .39$ or $G = 1.32 \pm .16$. Thus the observed value fell within the range of the probable error. But the agreement is often much closer. The results of a little experiment made by the writer are as follows. A pack of cards was thoroughly shuffled and the cards turned up and their value recorded in order (Ace = 1, Jack = 11, Queen = 12, King = 13). The mean deviation is forced in this case to be 42/13 or 3.231. The observed mean variation was 4.314, making $G = 1.335$, while the expected value of G as given by Woolard's method for this case of rectangular distribution is 1.333.

and (9) give the first, second and third integrals of these values. These figures are plotted on Plate III. The period of the cycle in the third integral curve is 21.5 and the amplitude is about 200. The original cycle which would give this as a third integral would be $4.30+5.00 \cos \frac{k(x-7.5)}{24.5}$. This curve is plotted on the upper figure of Plate III as a solid line. The cyclic amounts added to the random data are plotted (above or below the line of the mean, 4.30) as crosses and connected by a dotted line. The cycle that emerges from the process is not quite the one that went in—it has been combined with the pseudo-cycle which arises from the fortuitous variations—but it is still a fair approximation of the original cycle. We can then assume that cycles derived by this process from statistical data that contain real cycles will be approximations of true cycles.

Goutereau's ratio gives a means of determining whether real cycles are present. If there are none it is not necessary to search for them. If there are cycles present two courses are open to us. We may first construct a periodogram and find whether there are short cycles present. If not, we can assume that a long-period cycle determined by the method of this paper will be real. If there are short period cycles present, we can eliminate them and test the residue by Goutereau's ratio. If it still contains a cycle, we can assume that there is a real long-period cycle. The other procedure would be to first find the long-period cycle by the method of this paper. If the amplitude of the cycle is large, it is quite certainly a real cycle. If it is very small, it may perhaps be negligible, even if real, and is probably unreal. In doubtful cases the cycle deduced may be subtracted from the given data and the residue tested again by Goutereau's ratio. If G is markedly larger than it was in the original data, we may assume that the cycle is real.

Criteria as to the reality of a given cycle have been proposed by C. F. Marvin[1], H. W. Clough[2], Dinsmore Alter[3], and Sir Gilbert Walker[4], but they are adapted only to cycles obtained by means of the

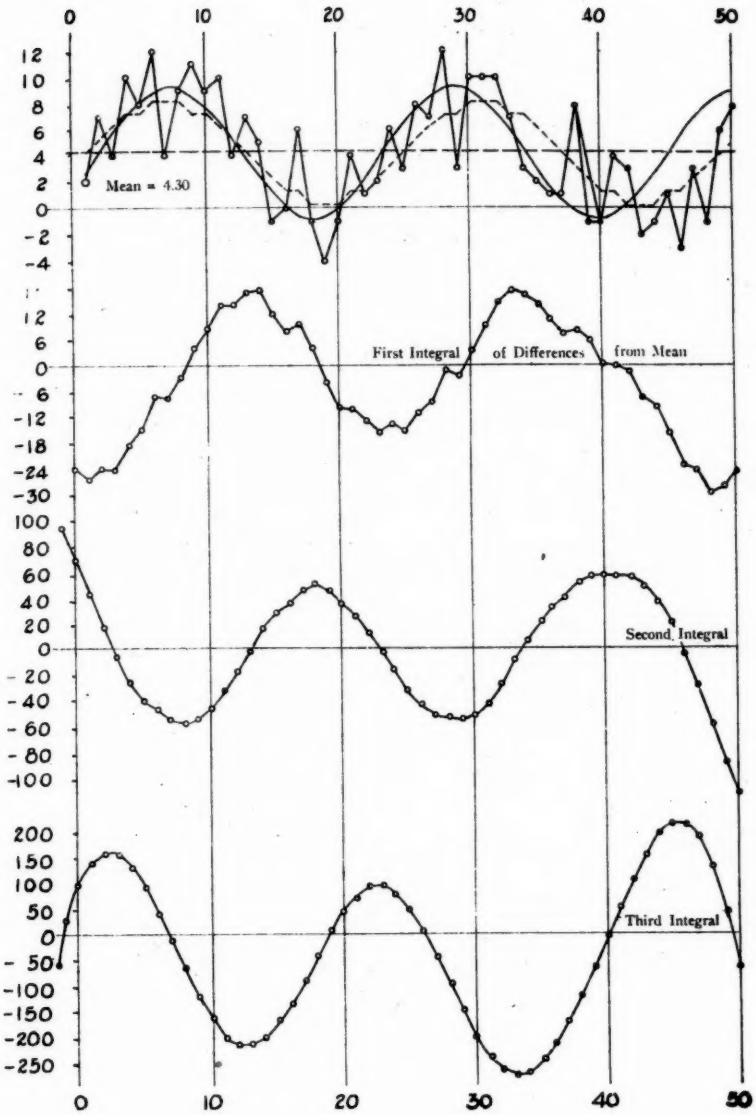
1. Theory and Use of the Periodocite, Monthly Weather Review, Vol. 49 (1921), pp. 115-124.

2. A Statistical Comparison of Meteorological Data with Data of Random Occurrence, Monthly Weather Review, Vol. 49 (1921), pp. 124-132.

3. The Criteria of Reality in the Periodogram, Monthly Weather Review, Vol. 54 (1926), pp. 57-58.

4. On Periodicity. Quart. Jour. Royal Met'l Soc., 51, No. 216, pp. 337-346.

PLATE III



Random Data of Plate II Combined with a Cycle
(the Dashed Curve at the Top of This Plate).

periodogram and not very well even to those[1].

The question still remains as to how much less than the expected value for random succession G may be before we are to believe that a cycle is present. The writer would hazard 10 per cent as a rough guess. It is to be hoped that some master of mathematical statistics will give us before long a quantitative statement of, say, the relationship between the ratio of the observed mean variation and the expected mean variation for the same numbers arranged in random succession, and the probability of a cycle of given amplitude being present.

It should be added that the germ idea of this paper is a product of the fertile mind of the writer's colleague, Professor P. W. Ott.

Conclusions

(1) The method of successive integration of discrepancies will reveal the approximate period of long-period cycles if they are present.

(2) Even if no long-period cycle is present, the method will give a fictitious cycle, but there are tests by which the reality or falsity of the cycle can be investigated.

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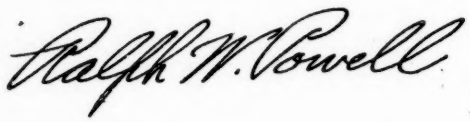
1. For example, Marvin's criterion depends only upon the standard deviations of the sums of the various columns of the tabulation as compared to the standard deviation of all the data, without reference to the order of the columns. Take, for example, the tabulation given on page 353 of Whitaker-Robinson's "Calculus of Observations." It is very evident that there is a real cycle. But suppose that another problem had yielded exactly the same columns of data but in a random order, say the fifth column, then the twentieth, then the third, etc. Are we to suppose that a cycle of period 24 days is equally probable in this case? This objection seems to the writer to make the method of Whitaker and Robinson much inferior to that of Schuster.



EQUIMODAL FREQUENCY DISTRIBUTIONS

By

EDWIN D. MOUZON, JR.

The object of this paper is the determination of a set of frequency curves, each of which will give a better fit to the modal neighborhood of the data to which it is applied than is often found in the existing methods. Interest in this subject was aroused in the following way. First, it was discovered that a great number of distributions of data derived from a study of the financial ratios of public utility companies conformed to the same general type of curve. Second, it developed that the type of curve designated by the Pearsonian criterion quite often yielded a very poor fit to the data. The mode determined by the theoretical curve was obviously unsuited to the actual data. Furthermore, in some cases, on the left extremity of the distribution, the rise of the curve to the mode was too steep for a good fit. The accompanying chart (p. 140) presents a particular instance of these conditions, together with the curve fitted by the method developed in this paper.

The curves which were used in this study of financial ratios were those developed by Pearson and Elderton from a consideration of the various cases which arose in the solution of the differential equation

$$\frac{dy}{dx} = \frac{y(x-a)}{F(x)}$$

where $F(x)$ was assumed to be expansible in ascending powers of x. The other assumptions made were that $F(x) = b_0 + b_1 x + b_2 x^2$, and that the constants a, b_0, b_1, and b_2 were determined by equating the moments of the raw data to the moments of the theoretical distribution. Here we will modify these assumptions, and under the new conditions determine the principal types of curves which arise when the polynomial in the denominator is of the third or lower degree.

The new assumption is that the value of the constant, a, the mode, is determined first from the observed data, and equated to the value of the mode in the theoretical distribution. This method of procedure is particularly adapted to economic data, as it assures a good

fit about the mode, notwithstanding the fact that in some raw data the mode is a rather vague concept. The fit about the mode is of primary importance in much economic data.

II. We begin with the case of the cubic in the denominator, that is with the differential equation

$$\frac{dy}{dx} = \frac{(x-a)\,y}{b_0 + b_1 x + b_2 x^2 + b_3 x^3}, \text{ or}$$

$$(b_0 + b_1 x + b_2 x^2 + b_3 x^3)\,\frac{dy}{dx} = y\,(x-a)$$

where a is known. Multiplying both sides by x^n, integrating, and using the notation $\mu'_n = \int y\, x^n\, dx$, we have

$$n b_0 \mu'_{n-1} + (n+1) b_1 \mu'_n + (n+2) b_2 \mu'_{n+1} + (n+3) b_3 \mu'_{n+2} = a\mu'_n - \mu'_{n+1}$$

Putting $n = 0, 1, 2, 3$, and changing the origin to the mean, we have

$$(1) \quad \begin{cases} 0\,b_0 + b_1 + 0\,b_2 + 3\mu_2 b_3 = a \\ b_0 + 0\,b_1 + 3\mu_2 b_2 + 4\mu_3 b_3 = -\mu_2 \\ 0\,b_0 + 3\mu_2 b_1 + 4\mu_3 b_2 + 5\mu_4 b_3 = a\mu_2 - \mu_3 \\ 3\mu_2 b_0 + 4\mu_3 b_1 + 5\mu_4 b_2 + 6\mu_5 b_3 = a\mu_3 - \mu_4 \end{cases}$$

Solving these equations for b_0, b_1, b_2, and b_3, we have

$$b_0 = \frac{\begin{vmatrix} a & 1 & 0 & 3\mu_2 \\ -\mu_2 & 0 & 3\mu_2 & 4\mu_3 \\ a\mu_2 - \mu_3 & 3\mu_2 & 4\mu_3 & 5\mu_4 \\ a\mu_3 - \mu_4 & 4\mu_3 & 5\mu_4 & 6\mu_5 \end{vmatrix}}{\begin{vmatrix} 0 & 1 & 0 & 3\mu_2 \\ 1 & 0 & 3\mu_2 & 4\mu_3 \\ 0 & 3\mu_2 & 4\mu_3 & 5\mu_4 \\ 3\mu_2 & 4\mu_3 & 5\mu_4 & 6\mu_5 \end{vmatrix}} = \frac{A}{\Delta}$$

$$b_1 = \frac{\begin{vmatrix} 0 & a & 0 & 3\mu_2 \\ 1 & -\mu_2 & 3\mu_2 & 4\mu_3 \\ 0 & a\mu_2-\mu_3 & 4\mu_3 & 5\mu_4 \\ 3\mu_2 & a\mu_3-\mu_4 & 5\mu_4 & 6\mu_5 \end{vmatrix}}{\Delta} = \frac{B}{\Delta}$$

$$b_2 = \frac{\begin{vmatrix} 0 & 1 & a & 3\mu_2 \\ 1 & 0 & -\mu_2 & 4\mu_3 \\ 0 & 3\mu_2 & a\mu_2-\mu_3 & 5\mu_4 \\ 3\mu_2 & 4\mu_3 & a\mu_3-\mu_4 & 6\mu_5 \end{vmatrix}}{\Delta} = \frac{C}{\Delta}$$

$$b_3 = \frac{\begin{vmatrix} 0 & 1 & 0 & a \\ 1 & 0 & 3\mu_2 & -\mu_2 \\ 0 & 3\mu_2 & 4\mu_3 & a\mu_2-\mu_3 \\ 3\mu_2 & 4\mu_3 & 5\mu_4 & a\mu_3-\mu_4 \end{vmatrix}}{\Delta} = \frac{D}{\Delta}$$

The differential equation then becomes

$$\frac{dy}{y} = \frac{(x-a)\,dx}{\frac{A}{\Delta} + \frac{Bx}{\Delta} + \frac{Cx^2}{\Delta} + \frac{Dx^3}{\Delta}}$$

The solution of the differential equation depends on the nature of the zeros of the denominator of the right hand member, that is on the discriminant of the general cubic,

$$18\,b_3 b_2 b_1 b_0 - 4b_2^3 b_0 + b_2^2 b_1^2 - 4b_2 b_1^3 - 27\,b_3^2 b_0^2$$

The cubic has three distinct real zeros, one real and two imaginary zeros, or at least two real and equal zeros, according as the discriminant is greater than zero, less than zero, or equal to zero. We will expect, therefore, three general types of curves when the integration is effected.

III. If we assume that $b_3 = 0$, we will have only three constants, b_0, b_1, and b_2 to determine, and the equations (1) become

$$(2) \quad \begin{cases} b_1 = \partial \\ b_0 + 3b_2\mu_2 = -\mu_2 \\ 3b_1\mu_2 + 4b_2\mu_3 = -\mu_3 + \partial\mu_2 \end{cases}$$

Solving these equations simultaneously, we find

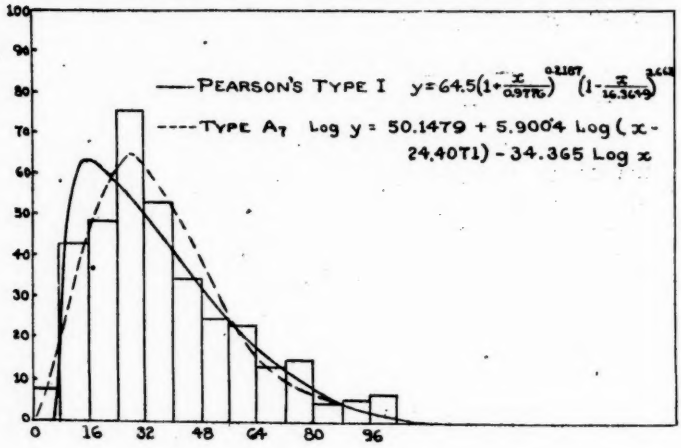
$$b_0 = \frac{-\mu_2\mu_3 + 6\partial\mu_2^2}{4\mu_3}$$

$$b_1 = \partial$$

$$b_2 = \frac{-\mu_3 - 2\partial\mu_2}{4\mu_3}$$

Thus, in the case of the quadratic in the denominator, we have determined the constants in terms of the mode, and the first, second, and third moments of the raw data. In other words, we are calculating the theoretical curve under the assumption that its mode, mean, standard deviation, and skewness are equal respectively to the mode,

Ratio of Revenue to Net Worth in 351 Traction Companies



mean, standard deviation, and skewness of the raw data. The differential equation then becomes

$$\frac{1}{y}\frac{dy}{dx} = \frac{x-\partial}{\frac{-\mu_2\mu_3+6\partial\mu_2^2}{4\mu_3} + \partial x + \frac{-\mu_3-2\partial\mu_2}{4\mu_3}x^2}$$

Now, the solution of this differential equation depends on the particular values of the constants in the denominator, i. e., on the quadratic discriminant $b_1^2 - 4b_0b_2$. Again, we will expect three general types of curves when the integration is effected.

If we assume $b_3 = b_2 = 0$, equations (1) become

$$b_1 = \partial$$

(3)

$$b_0 = -\mu_2$$

and the differential equation is

$$\frac{1}{y}\frac{dy}{dx} = -\frac{x-\partial}{\mu_2 - \partial x}$$

If we keep only b_0, we have $b_0 = -\mu_2$, and $\partial = 0$ and our equation is $\frac{1}{y}\frac{dy}{dx} = -\frac{x}{\mu_2}$

We now turn to a discussion of the various types of curves which arise from the solution of the preceding differential equations. The following classification will be made—Class A will include all curves arising from the solution of differential equations in which $F(x)$ has real and unequal zeros. Class B will include all curves arising from the solution of differential equations in which $F(x)$ has complex zeros. Class C will include all curves arising from the solution of differential equations in which $F(x)$ has at least two equal zeros.

Type A-1

IV. When all the zeros are positive, the differential equation may be written in the form

$$\frac{dy}{y} = \frac{(x-\partial)dx}{b_3(x-A_1)(x-A_2)(x-A_3)}$$

where we assume $A_1 > A_2 > A_3$. Separating into partial fractions and integrating, we have

$$\log y = \frac{(A_2 - A_3)(A_1 - \partial)}{b_3 (A_1 - A_3)(A_2 - A_3)(A_1 - A_2)} \log (x - A_1)$$
$$- \frac{(A_1 - A_3)(A_2 - \partial)}{b_3 (A_1 - A_3)(A_2 - A_3)(A_1 - A_2)} \log (x - A_2)$$
$$+ \frac{(A_1 - A_2)(A_3 - \partial)}{b_3 (A_1 - A_3)(A_2 - A_3)(A_1 - A_2)} \log (x - A_3)$$
$$+ \log k$$

Exponentiating

$$y = \frac{k(x-A_1)^{\frac{(A_2 - A_3)(A_1 - \partial)}{b_3 (A_1 - A_3)(A_2 - A_3)(A_1 - A_2)}} (x - A_3)^{\frac{(A_1 - A_2)(A_3 - \partial)}{b_3 (A_1 - A_3)(A_2 - A_3)(A_1 - A_2)}}}{(x - A_2)^{\frac{(A_1 - A_3)(A_2 - \partial)}{b_3 (A_1 - A_3)(A_2 - A_3)(A_1 - A_2)}}}$$

Transferring the origin to the mode, i. e., putting x for $x - \partial$ we have

$$y = \frac{k (x + \partial - A_1)^{\frac{c_1 \partial_1}{S}} (x + \partial - A_3)^{\frac{c_3 \partial_3}{S}}}{(x + \partial - A_2)^{\frac{c_2 \partial_2}{S}}}$$

$$= \frac{y_0 (1 - x/\partial_1)^{\frac{c_1 \partial_1}{S}} (1 - x/\partial_3)^{\frac{c_3 \partial_3}{S}}}{(1 - x/\partial_2)^{\frac{c_2 \partial_2}{S}}}$$

where

$$c_1 = A_2 - A_3 \qquad c_2 = A_1 - A_3 \qquad c_3 = A_1 - A_2$$
$$\partial_1 = A_1 - \partial \qquad \partial_2 = A_2 - \partial \qquad \partial_3 = A_3 - \partial$$
$$S = b_3 (A_1 - A_2)(A_1 - A_3)(A_2 - A_3)$$

Then $c_2 \partial_2 = c_1 \partial_1 + c_3 \partial_3$

Let $\frac{c_1}{S} = m_1$, $\frac{c_2}{S} = m_2$, $\frac{c_3}{S} = m_3$

Then $m_2 = m_1 - m_3$

The equation now becomes

$$y = \frac{y_o (1 - x/a_1)^{m_1 a_1} (1 - x/a_3)^{m_3 a_3}}{(1 - \frac{x}{a_2})^{m_2 a_2}}$$

With the exception of y_o, the values of all the constants in the equation are known in terms of moments. Two methods will be given for its determination.

First—Calculate the area under the curve, using the theoretical ordinates measured in terms of y_o. Let this area equal N, the number of observations, and solve for y_o.

Thus $y = \frac{N}{B_1 + B_2 + \cdots + B_n}$, where $y_o B_i$ represents the areas calculated from the theoretical ordinates.

Second—Calculate the value of χ^2 (Chi-square) with the theoretical ordinates measured in terms of y_o. Set the first derivative of this expression equal to zero, and determine the value of y_o which makes χ^2 a minimum. From the goodness of fit point of view, this gives the best possible value of y_o.

Thus $\chi^2 = \sum \frac{(y_o B_i - O_i)^2}{y_o B_i}$, where the $y_o B_i$ represent the theoretical areas as before, and the O_i represent the observed areas.

Setting the first derivative of this expression equal to zero, we have

$$\sum B_i - \frac{1}{y_o^2} \sum \frac{O_i^2}{B_i} = 0$$

$$y_o^2 = \frac{\sum \frac{O_i^2}{B_i}}{\sum B_i}$$

TYPE A-2

V. When there are two positive zeros and one negative zero, the

equation may be written in the form

$$\frac{dy}{y} = \frac{(x-\partial)\,dx}{b_3(x-A_1)(x-A_2)(x+A_3)}, \quad \text{where } A_1 > A_2 > -A_3$$

Proceeding as in Type A-I, we find

$$y = \frac{y_0\left(1-x/\partial_1\right)^{\frac{c_1\partial_1}{s}}}{\left(1-x/\partial_2\right)^{\frac{c_2\partial_2}{s}}\left(1-x/\partial_3\right)^{\frac{c_3\partial_3}{s}}}$$

where

$$c_1 = A_2 + A_3 \qquad \partial_1 = A_1 - \partial$$

$$c_2 = A_1 + A_3 \qquad \partial_2 = A_2 - \partial \qquad s = b_3 c_1 c_2 c_3$$

$$c_3 = A_1 - A_2 \qquad \partial_3 = A_3 + \partial$$

y_0 is calculated as in Type A-I. The origin is at the mode.

Type A-3

VI. When there are two negative zeros and one positive zero, the equation may be written in the form

$$\frac{dy}{y} = \frac{(x-\partial)\,dx}{b_3(x-A_1)(x+A_2)(x+A_3)}, \quad \text{where } A_1 > -A_2 > -A_3$$

Using the same method as before, we find

$$y = \frac{y_0\left(1-x/\partial_1\right)^{\frac{c_1\partial_1}{s}}\left(1+x/\partial_2\right)^{\frac{c_2\partial_2}{s}}}{\left(1+x/\partial_3\right)^{\frac{c_3\partial_3}{s}}}, \quad \text{where}$$

$$\partial_1 = A_1 - \partial \qquad c_1 = -A_2 + A_3$$

$$\partial_2 = A_2 + \partial \qquad c_2 = A_1 + A_3 \qquad s = b_3 c_1 c_2 c_3$$

$$\partial_3 = A_3 + \partial \qquad c_3 = A_1 + A_2$$

y_0 is calculated as in the previous cases. The origin is at the mode.

TYPE A-4

VII. Where all three zeros are negative, the equation may be written in the form

$$\frac{dy}{y} = \frac{(x-\partial)\,dx}{b_3(x+A_1)(x+A_2)(x+A_3)}, \text{ where } -A_1 > -A_2 > -A_3$$

Proceeding as in the last three cases, we find

$$y = \frac{y_o\left(1+x/\partial_2\right)^{\frac{c_2\partial_2}{s}}}{\left(1+x/\partial_1\right)^{\frac{c_1\partial_1}{s}}\left(1+x/\partial_3\right)^{\frac{c_3\partial_3}{s}}}, \text{ where}$$

$\partial_1 = A_1+\partial$ $\quad c_1 = -A_2+A_3$

$\partial_2 = A_2+\partial$ $\quad c_2 = -A_1+A_3$ $\quad s = b_3 c_1 c_2 c_3$

$\partial_3 = A_3+\partial$ $\quad c_3 = -A_1+A_2$

y_o is determined as in the previous cases. The origin is at the mode.

TYPE A-5

VIII. In Type A-3, suppose $A_1 = A_2$. Then

$$y = \frac{y_o\left(1-x/A_1-\partial\right)^{\frac{(-A_1+A_3)(A_1-\partial)}{s}}\left(1+x/A_1+\partial\right)^{\frac{(A_1+A_3)(A_1+\partial)}{s}}}{\left(1+\frac{x}{A_3+\partial}\right)^{\frac{2A_1(A_3+\partial)}{s}}}$$

where $s = b_3\ (A_1+A_3)(-A_1+A_3)\ (2A_1)$

Suppose ∂, the mode, is at the mean, that is, is equal to zero. Then

$$A_1-\partial = A_1+\partial = \partial_1$$

Then

$$y = \frac{y_0 \left(1 - x/a_1\right)^{\frac{(-A_1 + A_2)\, a_1}{s}} \left(1 + x/a_1\right)^{\frac{(A_1 + A_2)\, a_1}{s}}}{\left(1 + x/a_2\right)^{\frac{2A_1 a_2}{s}}}$$

y_0 is calculated as before. The origin is at the mode.

Type A-6

IX. In Type A-3, suppose one of the zeros is zero, say A_1. The equation then becomes

$$y = \frac{k x^{\frac{(-A_2 + A_3)(-a)}{b_2 A_2 A_3 (-A_2 + A_3)}} \left(x + A_2\right)^{\frac{A_2 (A_2 + a)}{b_2 A_2 A_3 (-A_2 + A_3)}}}{\left(x + A_3\right)^{\frac{A_3 (A_3 + a)}{b_2 A_2 A_3 (-A_2 + A_3)}}}$$

$$= \frac{y_0 x^{\frac{-a}{b_2 A_2 A_3}} \left(1 + x/A_2\right)^{\frac{A_2 + a}{b_2 A_2 (-A_2 + A_3)}}}{\left(1 + x/A_3\right)^{\frac{A_3 + a}{b_2 A_3 (-A_2 + A_3)}}}$$

The values of all the constants except y_0 are known, and it may be calculated by either of the formulas given in Type A-1.

The origin is at the mean.

Type A-7

X. In case $F(x)$ is quadratic, and its zeros are of like sign, we have

$$\frac{dy}{y} = \frac{(x - a)\, dx}{b_2 (x + A_1)(x + A_2)} = \frac{A_1 + a}{b_2 (A_1 - A_2)} \frac{dx}{x + A_1} - \frac{A_2 + a}{b_2 (A_1 - A_2)} \frac{dx}{x + A_2}$$

Integrating, we have

$$\log y = \frac{A_1 + a}{b_2 (A_1 - A_2)} \log (x + A_1) + \frac{-(A_2 + a)}{b_2 (A_1 - A_2)} \log (x + A_2) + \log y'$$

Exponentiating,

$$y = y'(x+A_1)^{\frac{A_1+a}{b_2(A_1-A_2)}}(x+A_2)^{\frac{-(A_2+a)}{b_2(A_1-A_2)}}$$

Changing x to $x-A_2$, we have

$$y = y'(x+A_1-A_2)^{\frac{A_1+a}{b_2(A_1-A_2)}}\, x^{\frac{-(A_2+a)}{b_2(A_1-A_2)}}$$

Let

$$A_1-A_2=-m \;;\quad \frac{A_1+a}{-b_2 m}=\rho_1 \;;\quad \frac{A_2+a}{b_2 m}=\rho_2$$

Then

$$y = y_o\,(x-m)^{\rho_1}x^{\rho_2}$$

The constants A_1 and A_2 are given by the zeros of the quadratic in the denominator, and m, ρ_1, and ρ_2 are given in terms of these above. By integration of this equation between the limits m and ∞, it has been found[1] that

$$y_o = \frac{N\Gamma(\rho_2)\; m^{\rho_2-\rho_1-1}}{\Gamma(\rho_1+1)\,\Gamma(\rho_2-\rho_1-1)}$$

y_o may also be determined by finite integration by either of the methods given in Type A-1.

Origin = Mean $- A_2$

Type A-8

XI. This type occurs when $F(x)$ is a quadratic and the zeros are real and opposite in sign. The equation then becomes

$$\frac{dy}{y} = \frac{1}{b_2}\,\frac{x-a}{(x+A_1)(x-A_2)}$$

1. Elderton, "Frequency Curves and Correlation," p. 85.

Integrating, we obtain

$$\log y = \frac{1}{b_2}\,\frac{A_1+\partial}{A_1+A_2}\,\log(x+A_1)+\frac{1}{b_2}\,\frac{A_2-\partial}{A_1+A_2}\,\log(x-A_2)-\log y'$$

Exponentiating,

$$y = y'(x+A_1)^{\frac{1}{b_2}\frac{A_1+\partial}{A_1+A_2}}(x-A_2)^{\frac{1}{b_2}\frac{A_2-\partial}{A_1+A_2}}$$

Now, changing the origin to the mode, i. e., putting x for $x-\partial$, we have

$$y = y'(x+A_1+\partial)^{\frac{1}{b_2}\frac{A_1+\partial}{A_1+A_2}}(x-A_2+\partial)^{\frac{1}{b_2}\frac{A_2-\partial}{A_1+A_2}}$$

$$= y_0\left(1+\frac{x}{\partial_1}\right)^{m_1}\left(1-\frac{x}{\partial_2}\right)^{m_2}$$

where

$$\partial_1 = A_1+\partial \quad ; \quad \partial_2 = A_2-\partial$$

$$m_1 = \frac{1}{b_2}\,\frac{\partial_1}{A_1+A_2} \quad ; \quad m_2 = \frac{1}{b_2}\,\frac{\partial_2}{A_1+A_2}$$

and

$$\frac{m_1}{\partial_1} = \frac{m_2}{\partial_2}$$

The value of y_0 has been found[1] by integration to be

$$y_0 = \frac{N m_1^{m_1} m_2^{m_2}\,\Gamma(m_1+m_2+2)}{b(m_1+m_2)^{m_1+m_2}\,\Gamma(m_1+1)\,\Gamma(m_2+1)}$$

Where $b=\partial_1+\partial_2$, N = total frequency. y_0 may also be calculated by either of the methods given in Type A-1. The origin is at the mode.

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1. Elderton, "Frequency Curves and Correlation," p. 59.

TYPE A-9

XII. If the zeros of the quadratic are A_1, and $-A_2$, the equation may be written

$$\frac{dy}{y} = \frac{1}{b_2}\,\frac{A_1-a}{2A_1}\,\frac{dx}{x-A_1} + \frac{1}{b_2}\,\frac{A_2+a}{2A_2}\,\frac{dx}{x+A_2}$$

Integrating, we obtain

$$\log y = \frac{1}{b_2}\,\frac{A_1-a}{2A_1}\,\log(x-A_1) + \frac{1}{b_2}\,\frac{A_2+a}{2A_2}\,\log(x+A_2) + \log y'$$

Exponentiating,

$$y = y'(x-A_1)^{\frac{1}{b_2}\frac{A_1-a}{2A_1}}(x+A_2)^{\frac{1}{b_2}\frac{A_2+a}{2A_2}}$$

Changing the origin to the mode, i. e., putting x for $x-a$, we have

$$y = y'(x+a-A_1)^{\frac{1}{b_2}\frac{A_1-a}{2A_1}}(x+a+A_2)^{\frac{1}{b_2}\frac{A_2+a}{2A_2}}$$

$$= y_0\left(1-\frac{x}{a_1}\right)^{m_1}\left(1+\frac{x}{c_1}\right)^{m_2}$$

where

$$a_1 = A_1 - a \qquad a_1 + 2a = A_2 + a = c_1$$

$$\frac{a_1}{2b_2A_1} = m_1 \qquad \frac{c_1}{2b_2A_2} = m_2$$

Then, as before,

$$y_0 = \frac{N}{a_1+c_1}\cdot\frac{m_1^{m_1}m_2^{m_2}\,\Gamma(m_1+m_2+2)}{(m_1+m_2)^{m_1+m_2}\,\Gamma(m_1+1)\,\Gamma(m_2+1)}$$

TYPE A-10

XIII. If $F(x)$ is assumed to be linear, the equation may be written

$$\frac{dy}{y} = \frac{x-a}{b_0+b_1x}\,dx = \left(\frac{1}{b_1} + \frac{-a-\frac{b_0}{b_1}}{b_1x+b_0}\right)dx$$

Integrating,

$$\log y = \frac{x}{b_1} + \frac{1}{b_1}\left(-a-\frac{b_0}{b_1}\right)\log\,(b_1x+b_0) + \log y'$$

Exponentiating,

$$y = y'\,e^{\frac{x}{b_1}}(b_1x+b_0)^{-\frac{1}{b_1}\left(a+\frac{b_0}{b_1}\right)}$$

Changing the origin to the mode by putting x for $x-a$, we have

$$y = y''e^{\frac{x+a}{b_1}}\left(1+\frac{x}{\frac{b_1a+b_0}{b_1}}\right)^{-\frac{1}{b_1}\left(\frac{b_1a+b_0}{b_1}\right)}$$

Now let

$$y''e^{\frac{a}{b_1}} = y_0 \quad ; \quad \frac{ab_1+b_0}{b_1} = m \quad ; \quad -\frac{1}{b_1} = \gamma$$

Then

$$y = y_0\,e^{-\gamma x}\left(1+\frac{x}{m}\right)^{\gamma m}$$

The constants may be determined as follows:

When $b_2 = b_3 = 0$, it has been found that

$$b_0 = -\mu_2 \quad ; \quad b_1 = a$$

$$\therefore\ m = \frac{ab_1+b_0}{b_1} = \frac{a^2-\mu_2}{a}$$

$$\gamma = -\frac{1}{b_1} = -\frac{1}{a}$$

The value of y_o has been found[1] to be

$$y_o = \frac{Nq^{q+1}}{me^q \Gamma(q+1)}$$

where $q = \gamma m$.

y_o may also be found by the methods of Type A-1. The origin is at the mode.

TYPE A-11 (The normal curve)

XIV. Putting $b_1 = b_2 = b_3 = 0$, we have

$$\frac{dy}{y} = \frac{x-a}{b_o}\,dx$$

Integrating,

$$\log y = \frac{x^2}{2b_o} - \frac{ax}{b_o} + \log c = \frac{(x-a)^2}{2b_o} + \log y'$$

Exponentiating,

$$y = y' e^{\frac{(x-a)^2}{2b_o}}$$

Changing the origin to the mode, and substituting the value for b_o when $b_1 = b_2 = b_3 = 0$, that is $b_o = -\mu_2$, we obtain

$$y = y_o e^{-\frac{x^2}{2\mu_2}}$$

To find the value of y_o , integrate between the limits $-\infty$ and ∞ and find the total frequency N. It has been found[2] that

$$y_o = \frac{N}{\sqrt{2\pi\mu_2}}$$

1. Elderton, "Frequency Curves and Correlation," p. 68.
2. Elderton, "Frequency Curves and Correlation," p. 91.

y_o may also be found by either of the other two methods. The origin is at the mode.

Type B-1

XV. When $F(x)$ is a cubic, and two of the zeros are complex, the differential equation may be written in the form

$$\frac{dy}{y} = \frac{(x-a)\,dx}{b_3\,(x-A_1)\,[x^2-(A_2+A_3)\,x+A_2A_3]}, \text{ where } (A_2-A_3)^2<0$$

Separating into partial fractions and integrating,

$$\int \frac{dy}{y} = \frac{A_1-a}{b_3\,[A_1(A_1-A_2-A_3)+A_2A_3]} \int \frac{dx}{x-A_1}$$

$$- \frac{A_1-a}{b_3\,[A_1(A_1-A_2-A_3)+A_2A_3]} \int \frac{x\,dx}{x^2-(A_2+A_3)\,x+A_2A_3}$$

$$+ \frac{a(A_1-A_2-A_3)+A_2A_3}{b_3\,[A_1(A_1-A_2-A_3)+A_2A_3]} \int \frac{dx}{x^2-(A_2+A_3)\,x+A_2A_3}$$

Now let $x' = x - \frac{A_2+A_3}{2}$; $M^2 = \frac{-(A_2-A_3)^2}{2}$

$$k = a(A_1-A_2-A_3)+A_2A_3 - \frac{(A_1-a)(A_2+A_3)}{2}$$

$$d = [A_1(A_1-A_2-A_3)+A_2A_3]\,b_3$$

Performing the integration, we have

$$\log y = \frac{A_1-a}{d} \log \left(x' + \frac{A_2+A_3}{2} - A_1\right) - \frac{A_1-a}{2d} \log (x'^2+M^2)$$

$$+ \frac{k}{Md} \tan^{-1}\frac{x'}{M} + \log y_o$$

Exponentiating,

$$y = \frac{y_o\,[x' + \frac{1}{2}(A_2+A_3) - A_1]^{\frac{A_1-a}{d}}\; e^{\frac{k}{Md}\tan^{-1}\frac{x'}{M}}}{(x'^2+M^2)^{\frac{A_1-a}{2d}}}$$

$$= \frac{y_o\,(x+c)^{2m}\; e^{\frac{k}{Md}\tan^{-1}\frac{x'}{M}}}{(x^2+M^2)^m}$$

where $m = \frac{A_1 - a}{2d}$, $\frac{A_2 + A_3}{2} - A_1 = c$

y_0 may be determined as in Type A-1. Origin = Mean + $\frac{A_2 + A_3}{2}$

Type B-2

XVI. When two of the zeros are pure imaginaries, the equation may be written:

$$\int \frac{dy}{y} = \frac{A_1 - a}{b_3(A_1^2 + A_2^2)} \int \frac{dx}{x - A_1} - \frac{A_1 - a}{2b_3(A_1^2 + A_2^2)} \int \frac{2x\,dx}{x^2 + A_2^2} + \frac{aA_1 + A_2^2}{b_3(A_1^2 + A_2^2)} \int \frac{dx}{x^2 + A_1^2}$$

Performing the integration, we have

$$\log y = \frac{A_1 - a}{b_3(A_1^2 + A_2^2)} \log (x - A_1) - \frac{A_1 - a}{2b_3(A_1^2 + A_2^2)} \log (x^2 + A_2^2) + \frac{aA_1 + A_2^2}{b_3 A_2 (A_1^2 + A_2^2)} \tan^{-1} \frac{x}{A_2} + \log y_0$$

Exponentiating, we have

$$y = \frac{y_0 (x - A_1)^{\frac{A_1 - a}{b_3(A_2^2 + A_1^2)}} e^{\frac{aA_1 + A_2^2}{b_3 A_2 (A_1^2 + A_2^2)} \tan^{-1} \frac{x}{A_2}}}{(x^2 + A_2^2)^{\frac{A_1 - a}{2b_3(A_1^2 - A_2^2)}}}$$

Let $b_3 (A_1^2 + A_2^2) = d$; $\frac{A_1 - a}{d} = 2m$; $aA_1 + A_2^2 = k$ Then

$$y = \frac{y_0 (x - A_1)^{2m} e^{\frac{k}{A_2 d} \tan^{-1} \frac{x}{A_2}}}{(x^2 + A_2^2)^m}$$

y_0 may be determined as in the previous case. The origin is at the mean.

Type B-3

XVII. If $F(x)$ is quadratic and the zeros are complex, the equation may be written

$$\int \frac{dy}{y} = \int \frac{(x-a)\,dx}{b_0+b_1 x+b_2 x^2} = \int \frac{(x-a)\,dx}{b_2\left[\left(x^2+\frac{b_1}{b_2}x+\frac{b_1^2}{4b_2^2}\right)+\left(\frac{b_0}{b_2}-\frac{b_1^2}{4b_2^2}\right)\right]}$$

Let $X = x+\frac{b_1}{2b_2}$; $A^2 = \frac{b_0}{b_2} - \frac{b_1^2}{4b^2}$

Then $x-a = X-\frac{b_1}{2b_2}-a = X+c$, where $c=-\left(\frac{b_1}{2b_2}+a\right)$

We have then

$$\log y = \int \frac{(X+c)\,dX}{b_2(X^2+A^2)} = \int \frac{X\,dX}{b_2(X^2+A^2)} + \frac{1}{b_2}\int \frac{c\,dX}{X^2+A^2}$$

$$= \frac{1}{2b_2}\log(X^2+A^2) + \frac{c}{Ab_2}\tan^{-1}\frac{X}{A} + \log y'$$

Exponentiating,

$$y = y'\,(X^2+A^2)^{\frac{1}{2b_2}}\, e^{\frac{c}{Ab_2}\tan^{-1}\frac{X}{A}}$$

$$= y_0\left(1+\frac{X^2}{A^2}\right)^{\frac{1}{2b_2}} e^{\frac{c}{Ab_2}\tan^{-1}\frac{X}{A}}$$

which may be written

$$y = y_0\left(1+\frac{X^2}{A^2}\right)^{-n} e^{-\gamma\tan^{-1}\frac{X}{A}},$$

where $n=-\frac{1}{2b_2}$; $-\gamma=\frac{c}{Ab_2}$; $A^2=\frac{4b_0b_2-b_1^2}{4b_2^2}$

y_0 may be calculated as in Type A-1. Origin = Mean $-\frac{b_1}{2b_2}$

TYPE C-1

XVIII. When $F(x)$ is cubic, and two zeros of the denominator are equal, the equation may be written in the form

$$\int \frac{dy}{y} = \int \frac{(x-\theta)\,dx}{b_3(x-A_1)^2(x-A_2)} = \frac{A_1-\theta}{b_3(A_1-A_2)} \int \frac{dx}{(x-A_1)^2}$$

$$- \frac{A_2-\theta}{b_3(A_1-A_2)^2} \int \frac{dx}{x-A_1} + \frac{A_2-\theta}{b_3(A_1-A_2)^2} \int \frac{dx}{x-A_2}$$

Performing the integration, we have

$$\log y = \frac{-(A_1-\theta)}{b_3(A_1-A_2)(x-A_1)} - \frac{A_2-\theta}{b_3(A_1-A_2)^2} \log(x-A_1)$$

$$+ \frac{A_2-\theta}{b_3(A_1-A_2)^2} \log(x-A_2) + \log y'$$

Exponentiating,

$$y = \frac{y' e^{-\frac{A_1-\theta}{b_3(A_1-A_2)(x-A_1)}} (x-A_2)^{\frac{A_2-\theta}{b_3(A_1-A_2)^2}}}{(x-A_1)^{\frac{A_2-\theta}{b_3(A_1-A_2)^2}}} = \frac{y' e^{\frac{-m_1}{x-A_1}} (x-A_2)^{m_2}}{(x-A_1)^{m_2}}$$

where $m_1 = \frac{A_1-\theta}{b_3(A_1-A_2)}$; $m_2 = \frac{A_2-\theta}{b_3(A_1-A_2)^2}$

Now, changing the origin to A_1, i. e., replacing x by $x+A_1$, we have

$$y = \frac{y' e^{-\frac{m_1}{x}} (x+A_1-A_2)^{m_2}}{x^{m_2}}$$

$$= \frac{y_0 e^{-\frac{m_1}{x}} \left(1+\frac{x}{k}\right)^{m_2}}{x^{m_2}}$$

where $k = A_1 - A_2$

y_0 may be determined as in the previous case.
Origin = Mean + A_1.

Type C-2

XIX. If all the zeros are equal, the equation may be written

$$\int \frac{dy}{y} = \int \frac{A_1 - a}{b_3 (x - A_1)^3}\, dx + \int \frac{dx}{b_3 (x - A_1)^2}$$

Integrating,

$$\log y = -\frac{A_1 - a}{2 b_3 (x - A_1)^2} - \frac{1}{b_3 (x - A_1)} + \log y_0$$

Exponentiating,

$$y = y_0\, e^{\frac{-(A_1 - a)}{2 b_3 (x - A_1)^2} - \frac{1}{b_3 (x - A_1)}} = y_0\, e^{\frac{A_1 - a - 2x}{2 b_3 (x - A_1)^2}}$$

where y_0 may be determined as before. Origin = Mean.

Type C-3

XX. When $F(x)$ is quadratic, and the zeros are real and equal, the equation may be written

$$\int \frac{dy}{y} = \int \frac{1}{b_2}\, \frac{(x - a)\, dx}{\left(x + \frac{b_1}{2 b_2}\right)^2}$$

$$= \int \frac{\left[\left(x + \frac{b_1}{2 b_2}\right) - \left(a + \frac{b_1}{2 b_2}\right)\right] dx}{b_2 \left(x + \frac{b_1}{2 b_2}\right)^2}$$

$$= \int \frac{dx}{b_2 \left(x + \frac{b_1}{2 b_2}\right)} - \int \frac{\left(a + \frac{b_1}{2 b_2}\right)}{b_2 \left(x + \frac{b_1}{2 b_2}\right)^2}\, dx$$

$$\therefore \log y = \frac{1}{b_2} \log \left(x + \frac{b_1}{2 b_2}\right) + \frac{a + \frac{b_1}{2 b_2}}{b_2 \left(x + \frac{b_1}{2 b_2}\right)} + \log y'$$

Exponentiating,

$$y = y' \left(x + \frac{b_1}{2b_2}\right)^{\frac{1}{b_2}} e^{\frac{a + \frac{b_1}{2b_2}}{b_2\left(x + \frac{b_1}{2b_2}\right)}}$$

Now let

$$x + \frac{b_1}{2b_2} = x' \; ; \; \frac{1}{b_2} = -\rho \; ; \; \frac{a + \frac{b_1}{2b_2}}{b_2} = -\gamma$$

Then $y = y_0 x^{-\rho} e^{-\frac{\gamma}{x}}$

The constants in terms of moments are

$$-\rho = \frac{-4\mu_3}{\mu_3 + 2a\mu_2} \; ; \; -\gamma = \frac{4\mu_3(a\mu_3 - 2a^2\mu_2)}{\mu_3^2 - 4a\mu_2\mu_3 + 4a^2\mu_2}$$

It has been found[1] that $y_0 = \frac{N\gamma^{\rho-1}}{\Gamma(\rho-1)}$. Origin = Mean - $\frac{b_1}{2b_2}$

XXI. The following example, illustrated in the chart (p. 140), is given to illustrate the method. The data is fitted by Type A-7.

Ratio of Revenue to Net Worth in Traction Companies

Ratio	Observed Frequency	Theoretical Frequency
.04	7	7.3
.12	43	31.9
.20	48	55.6
.28	75	63.6
.36	53	57.6
.44	34	45.1
.52	25	32.2
.60	22	21.6
.68	12	14.1
.76	14	8.6
.84	5	5.2
.92	6	3.2
1.00	7	1.9

1. Elderton, "Frequency Curves and Correlation," p. 82.

The constants calculated from the observed frequencies were

μ_2	= 6.4354	b_0	= −5.7908	m	= 24.97
μ_3	= 18.0115	b_1	= −1.2125	p_1	= 5.3312
Mean	= .376	b_2	= − .0334	p_2	= 35.2713
Mode	= .2793	A_1	= 5.6587	$\log y_0$	= 50.1479
a	= 1.2125	A_2	= 30.6287		

Origin at Mean − 30.6287 or 30.4287 to left of 53 group.

Curve starts at 30.4287 − 24.97 = 5.4587 before the center of this group.

EQUATION

$$y = y_0 (x - 24.97)^{5.3312} x^{-35.2713}$$

Edwin D. Mouzon, Jr.

ON FITTING CURVES TO OBSERVATIONAL SERIES BY THE METHOD OF DIFFERENCES

By

HARRY S. WILL

I. PRELIMINARY STATEMENT

Curve fitting may be technically described as the representation of a series of observations by a mathematical function. Given the observations and the function to be fitted, the problem is to determine the constants of the equation in such a way as to secure a valid representation. The method to be employed in the determination of these constants must take into account the object which the fitting process is intended to serve. If the object is to interpolate for undetermined items between specified ordinates of the series, any method which will give the constants of the equation will suffice, since the representation of the given ordinates is exact. In this case, questions of method will hinge on considerations of convenience. If, however, the object is to secure the representation of *all* the items of the series by means of a single function, questions of method will hinge on the validity of the representation, which, in this case, can only be approximate.

Functions used as approximate representations of observational series fall into two general classes: first, those which have the force of a law descriptive of a necessary sequence of events; and, second, those which depict a norm as a characteristic trend in growth. These two types of representation merit separate methodological consideration; and, in what is to follow, we shall make an analysis of the problems involved and develop a method, which, it is believed, will place in the hands of the statistician a new and serviceable instrument.

II. FUNDAMENTAL TYPES OF OBSERVATIONAL SERIES

For the purpose of fixing attention on certain characteristics of observational data, let us consider two distinctly different sorts of series. Let us suppose that the first series consists of a set of observations on a comet moving through space, and that the second consists of the record of gold production in the United States.

For the sake of simplicity, let us further suppose that the movement of both series is properly represented by the function $y=f(x)$. The two sets of observations may then be represented by an equation of the form

$$(1) \qquad Y \pm d \pm \epsilon = f(x) = Y \pm v$$

In this equation, the term ϵ represents an error of observation due to factors such as faulty judgment, clerical inaccuracies, and lack of precision in the use of instruments. The term d represents the deviation of the fitted function from the true magnitude of the phenomenon undergoing examination, after the series has been corrected for the errors ϵ. Taken together, d and ϵ make up the residuals

$$v = f(x) - Y$$

Now it is quite evident that, in the case of the first series, owing to the regularity of the path of the moving body, the deviations d will be negligibly small in comparison with the errors ϵ, and that, in the case of the second series, owing to the irregularity of production, the deviations d will be large in comparison with the errors ϵ. In fitting a curve to the first series, we assume that a true value exists and that the observational errors may be defined by the fitting process; while in fitting to the second, we assume a normal value merely, and seek to define the deviations of the observations from this norm.

These considerations suggest that the procedure which is applicable to the determination of constants in the one case may not be applicable in the other. Let us therefore inquire as to the solutions best suited to each case.

III. The Classical Solution

It was in 1806 that Legendre formulated his test of the validity attaching to the functional representation of an observational series. This formulation has become known as the principle of least squares and may be stated thus: *Where the constants of a mathematical function are to be determined from a set of empirical observations, that solution is best which makes the sum of the squares of the residual errors a minimum.*

So far as its mere statement is concerned, this principle is a rule of thumb which may be adopted or discarded at the discretion of the

individual. The principal has, however, been placed on a definite logical basis by Gauss and later writers, who have derived it from the normal law of error $p(x) = m \int_0^z e^{-z^2} dz$. Under the assumptions of this law, deviations from the most probable value are fortuitous in character, the term *fortuitous* implying that individual deviations are unanalytic in the sense that the forces operating to bring them about cannot be resolved into more elemental components. All that we can claim to know *a priori* about the values of such deviations is that they are as likely to be positive as negative and that they must remain within the bounds $\pm \infty$. The function $p(x)$ gives the probability for the occurrence of a deviation of magnitude $z = x/\sigma$.

Statisticians generally have accepted the principle of least squares as providing a sufficient theoretical basis for the fitting of curves to all sorts of series. Because of this, it becomes all the more important that certain limitations of the principle and its application to the analysis of statistical series should be carefully noted.

Considering again the case where the observations are made on a body moving through space, we see that the errors of observation committed may properly be regarded as fortuitous in character, for, on the basis of our assumption of precise motion in the path $y = f(x)$, the most probable value of the residuals is clearly defined as zero, so that the errors committed are as likely to be positive as negative; no finite bound can be set as to the possible magnitude of such random errors, and the forces determining their magnitudes cannot be resolved into their components. If our assumption as to the path of the moving body is valid, these errors conform to the normal law in the frequency of their occurrence, and their magnitudes may be accurately ascertained by a least squares determination of constants.

Returning now to the case where the observations consist of a record of gold production, can we claim to have the same basis for an application of least squares to the determination of our line of best fit? Two important considerations would lead us to think otherwise. The first of these is that the magnitude of deviations from trend is definitely restricted; for production is limited both by the capacity of the extractive industries and by the consumers' demand. The second is found in the highly analytic character of these deviations; for it is significant that whenever it becomes possible to resolve the forces determining the values of given deviations of a set into their elemental components, the prediction of the sign and magnitude of specified devia-

tions becomes in some measure possible; and when this occurs, such deviations are removed from the category of the fortuitous and unpredictable and placed in that of the analytic and predictable.

The arguments are supported by the use made of weighted deviations from trend in the forecasting of economic events. A rise in price or fall in production is not explained, in comparison with the normal trend, as a circumstance which is to be expected a certain number of times in a thousand, but rather because analysis shows the rise or fall to be the necessary result of known events. Obviously, a forecast based on unanalytic and purely fortuitous deviations could have no real significance whatever.

Granting that residuals may sometimes be obtained by least squares operations which may be regarded as a random sample of an approximately normal distribution, it must be clearly borne in mind that these residuals are brought into being by the creative act of curve fitting; and the mere marking off of a deviation does not justify our regarding it as being due to the working of forces distinct and different from those effective in producing the remaining part of the ordinate. In the case of the celestial observations which we have assumed, the act of fitting defines, but does not create, the errors.

The argument may be advanced at this point that it is not necessary to regard the principle of least squares as resting on the law of error; for we may obtain the normal equations from which our least squares determination is made by treating the solution as a simple problem in maxima and minima. But if we do, we cannot claim to have determined the *most probable* values of our constants; for this claim must rest on the derivation of the normal equations from the law of error.

The justification for the arbitrary use of the least squares technique that is most likely to be made is that it minimizes extreme deviations from the fitted line. This is unquestionably true; but it appears as a weakness of the method in the present connection rather than as an element of strength: for, in a least squares deduction of normal equations, we may regard each absolute deviation as being weighted with its own magnitude, deviations less than the mean deviation receiving weights less than the mean weight, and *vice versa*; and why, the query obtrudes, should we, in our determination of constants, overweight the observations most remote from what we term the norm

and underweight those which lie closest?

The argument that the least squares fit will avoid the commission of extreme errors in the projection of the curve beyond the limits of observation, or at least tend in that direction, is fallacious; for the fitting of a line to a given set of observations to secure the minimum sum of the squared residuals is unlikely to effect the same end when new observations are added. At least, we have no logical basis for the expectation of such a result unless we fall back on the position that the fitted curve describes a necessary sequence of events and that the residuals are fortuitous in character; and this is the very assumption we have found to be untenable for most economic and social series.

We may, then, say that fortuitous deviations are properly to be regarded as functions of the observations; while analytic deviations are to be regarded as functions of the hypothesis we set up with reference to the type of curve which is most appropriate to the data. In brief, our reasoning supplies a definite basis for the contention that, for data in which the errors of observation are small in comparison with the analytic deviations from trend, the least squares definitions do not lead to results which are to be regarded as necessarily best for all purposes.

IV. The Method of Differences

The method of curve fitting which is now to be presented was originated by the writer in the spring of 1925. Since that time, it has been put to a wide variety of practical tests and has been found to yield highly satisfactory results. The designation *method of differences* has been given to it because of the extensive and essential use made of the calculus of finite differences.

Before undertaking the task of deriving the formulas for the determination of constants, let us state the assumptions on which the method is based, as follows:

(a) The function to be fitted is logically appropriate to the data.

(b) The data are free of constant and systematic errors.

(c) Accidental errors of observation are relatively small and unimportant.

(d) Where a set of secular values is irregular and without sig-

nificant trend, the arithmetic mean is the best representation of the set.

The first of these assumptions is, in a general way, implied in any method of fitting. The effect of the second and third is to qualify the fitted deviations as analytic. The fourth is made use of constantly in the writing of formulas for the determination of parameters.

In the derivation of formulas, the essential steps are as follows: (1) equations defining each constant of the function fitted are developed by a process of differencing; (2) equations are formed from which approximations to the value of the given constant may be obtained; (3) the mean of the several approximations to the value of the given constant is taken as the most plausible value of the constant.

V. Notation

To avoid the possibility of misunderstanding, we shall explicitly define certain symbols made use of in this memoir.

The original observations are denoted by the symbol Y_i, $i = 0, 1, 2, \ldots n-1$; nd other capitals are used to designate empirical functions of the original observations; e. g., $U_i = Y_i - Y_o$. The symbol u_i denotes values of mathematical functions corresponding to the observations Y_i. The argument is denoted by the symbol

$$x_i, \quad x_i = i\Delta_x$$

Summations within the definite bounds a and b is indicated by the symbol $\sum_a^b$; e. g., $\sum_{i=0}^{i=n-1} y_i = y_o + y_1 + \ldots + y_{n-1}$.

Finite differences of order r and rank k are defined by the symbol Δ_k^r; e. g., $\Delta_k^r y_i = \Delta_k^{r-1} y_{i+k} - \Delta_k^{r-1} y_i$, where the difference of zero order is taken as the quantity undifferenced. In particular, we have $\Delta_k^0 y_i = y_i$; $\Delta_k y_i = y_{i+k} - y_i$; $\Delta_k^2 y_i = y_{i+2k} - 2y_{i+k} + y_i$; $\Delta_k^3 y_i = y_{i+3k} - 3y_{i+2k} + 3y_{i+k} - y_i$.

In these relations, the values of k and r are integral. The value of y_{i+k} is precisely the value of the function $y = f(x)$ when $x = x_i + k\Delta x$. In the difference operations of the following sections, the usage $\Delta_x^2 = (\Delta x)^2 \neq \Delta(x^2)$ is adhered to. Note that $\Delta_k \log y_i = \log y_{i+k} - \log y_i$, and also that $\log \Delta_k y_i = \log (y_{i+k} - y_i)$.

Since, on taking logarithms, ratios resolve themselves into differences between logarithms, we have, analagous to the differences $\Delta_k^r y_i$, the ratios $p_k^r y_i = p_k^{r-1} y_{i+k} : p_k^{r-1} y_i$, where the ratio of order $r = 0$ denotes the specified quantity. In particular, we have $p_k^0 y_i = y_i$; $p_k y_i = y_{i+k} : y_i$; $p_k^2 y_i = y_{i+2k} \cdot y_i : y_{i+k}^2$; $p_k^3 y_i = (y_{i+3k} \cdot y_{i+k}^3) : (y_{i+2k}^3 \cdot y_i)$.

In forming the first differences $\Delta_k y_i$, where k is the increment in the y subscript corresponding to the increment $k\Delta x$ in x_i, it will be noted that the first k values of y_i are excluded as minuend; hence we can form but $n-k$ first differences of rank k, that is, when the increment in the y subscript is k. Similarly, in forming the second differences $\Delta_k^2 y_i = \Delta_k y_{i+k} - \Delta_k y_i$, the first k values of $\Delta_k y_i$ are excluded from appearance as minuend; hence we can form but $n-k-k = n-2k$ second differences from n values of y when the rank of differences is k. In general, when the rank of differences is k, we may form $n-rk$ differences of order r from a set of values of y. Evidently, the number of ratios which may be formed from a given number of observations follows the same rule as that which applies to differences.

VI. Linear Series

Let us write the equation of the linear series in the form

$$y_i = a + bx_i . \tag{1}$$

Giving to x the increment $k\Delta x$, we get

$$y_{i+k} = a + b(x_i + k\Delta x) \tag{2}$$

Subtracting (1) from (2), we get

$$\Delta_k y_i = bk\Delta x \tag{3}$$

By making the substitution $\Delta_k Y_i$ for $\Delta_k y_i$ in equation (3), we may form $n-k$ approximations to the value of b, as follows:

$$\begin{aligned} b_0 &= \Delta_k Y_0 : k\Delta x \\ b_1 &= \Delta_k Y_1 : k\Delta x \\ &\cdots\cdots\cdots \\ b_{n-k-1} &= \Delta_k Y_{n-k-1} : k\Delta x \end{aligned} \tag{4}$$

Similarly, when b is determined, by substituting Y_i for y_i in equation (1), we are able to form n approximations to the value of a, as follows:

$$
\begin{aligned}
a_0 &= Y_0 - bx_0 \\
a_1 &= Y_1 - bx_1 \\
&\cdots\cdots \\
a_{n-1} &= Y_{n-1} - bx_{n-1}
\end{aligned}
\tag{5}
$$

By taking mean values of the approximations specified in equations (4) and (5), we arrive at the following formulas for determining the value of the parameters b and a:

$$
\begin{aligned}
b &= \left[\sum_{i=0}^{i=n-k-1} \Delta_k Y_i\right] : [k(n-k)\Delta x] . \\
a &= \left[\sum_{i=0}^{i=n-1} Y_i - b\sum_{i=0}^{i=n-1} x_i\right] : n .
\end{aligned}
\tag{6}
$$

$$2k = n \pm j \qquad j = 0 \text{ or } 1 .$$

This arbitrary determination of k will be justified in a later section.

VII. Parabolic Series

The equation of the quadratic parabola is

$$y_i = a + bx_i + cx_i^2 . \tag{1}$$

Giving to x the increment $k\Delta x$, we have

$$y_{i+k} = a + b(x_i + k\Delta x) + c(x_i + k\Delta x)^2 . \tag{2}$$

Subtracting (1) from (2), we have

$$\Delta_k y_i = bk\Delta x + ck\Delta x(2x_i + k\Delta x) . \tag{3}$$

Giving to x a second increment $k\Delta x$, we have

$$\Delta_k y_{i+k} = bk\Delta x + ck\Delta x\,(2x_i + 3k\Delta x) \tag{4}$$

Subtracting (3) from (4), we obtain

$$\Delta_k^2 y_i = 2ck^2\Delta x^2 \tag{5}$$

From equations (5), (3), and (1), we deduce the following approximations to parameters:

$$c_i = \Delta_k^2 Y_i : (2k^2\Delta x^2) \quad i = 0, 1, \cdots n-2k-1.$$

$$b_i = [\Delta_k Y_i - ck\Delta x\,(2x_i + k\Delta x)] : [k\Delta x],\ i = 0, 1, \cdots n-k-1. \tag{6}$$

$$a_i = Y_i - bx_i - cx_i^2, \quad i = 0, 1, \cdots n-1$$

Taking mean values of the approximations indicated in equations (6), we have the following formulas for the determination of parameters:

$$\begin{aligned} c &= \Big[\sum_{i=0}^{i=n-2k-1} \Delta_k^2 Y_i\Big] : [2k^2(n-2k)\Delta x^2]. \\ b &= \Big[\sum_{i=0}^{i=n-k-1} \Delta_k Y_i - ck\Delta x \sum_{i=0}^{i=n-k-1} (2x_i + k\Delta x)\Big] : [k(n-k)\Delta x]. \\ a &= \Big[\sum_{i=0}^{i=n-1} Y_i - b\sum_{i=0}^{i=n-1} x_i - c\sum_{i=0}^{i=n-1} x_i^2\Big] : n. \\ 3k &= n \pm j, \quad j = 0, 1, \text{ or } 2 \end{aligned} \tag{7}$$

We shall next write the equation of the cubic parabola, which is

$$y_i = a + bx_i + cx_i^2 + dx_i^3 \tag{8}$$

Giving to x the increment $k\Delta x$, we have

$$y_{i+k} = a + b(x_i + k\Delta x) + c(x_i + k\Delta x)^2 + d(x_i + k\Delta x)^3. \tag{9}$$

Subtracting (8) from (9), we get

$$\Delta_k y_i = bk\Delta x + ck\Delta x\,(2x_i + k\Delta x) + dk\Delta x(3x_i^2 + 3x_i k\Delta x + k^2\Delta x^2). \tag{10}$$

TABLE I

Production of Gold in the United States

(in units of $100,000)

$y = 695.75 + 53.89x - 2.81x^2$

Year	Y	y	v	Year	Y	y	v
1900	792	696	96	1911	969	949	20
1901	787	747	40	1912	935	938	- 3
1902	800	792	8	1913	883	921	-38
1903	736	832	-96	1914	945	899	46
1904	805	866	-61	1915	1010	872	138
1905	882	895	-13	1916	926	839	87
1906	944	918	26	1917	838	800	38
1907	904	935	-31	1918	686	755	-69
1908	946	947	- 1	1919	603	705	-102
1909	997	953	44	1920	512	650	-138
1910	963	954	9				
Σ					17863	17863	0

Mean error of estimate 52.6

Again giving to x the increment $k\Delta x$, we have

$$(11)\quad \Delta_k y_{i+k} = bk\Delta x + ck\Delta x\,(2x_i + 3k\Delta x) + dk\Delta x\,[3(x_i + k\Delta x)^2 + 3k\Delta x(x_i + k\Delta x) + k^2\Delta x^2].$$

Subtracting (10) from (1'), we obtain

$$(12)\quad \Delta_k^2 y_i = 2ck^2\Delta x^2 + 6dk^2\Delta x^2(x_i + k\Delta x).$$

Once more increasing x by $k\Delta x$, we have

$$(13)\quad \Delta_k^2 y_{i+k} = 2ck^2\Delta x^2 + 6dk^2\Delta x^2(x_i + 2k\Delta x).$$

Subtracting (12) from (13), we obtain finally

$$(14)\quad \Delta_k^3 y_i = 6dk^3\Delta x^3.$$

From equations (14), (12), (10), and (8), we deduce the follow-

ing parametric approximations:

$$d_i = \Delta_k^3 Y_i : (6k^3\Delta x^3), \quad i = 0, 1, \cdots n-3k-1.$$

$$c_i = [\Delta_k^2 Y_i - 6dk^2\Delta x^2(x_i + k\Delta x)] : [2k^2\Delta x^2], \quad i = 0, 1, \cdots n-2k-1.$$

(15) $$b_i = [\Delta_k Y_i - ck\Delta x(2x_i + k\Delta x) - dk\Delta x(3x_i^2 + 3x_i\, k\Delta x + k^2\Delta x^2)]$$
$$: [k\Delta x], \quad i = 0, 1, \cdots n-k-1.$$

$$a_i = Y_i - bx_i - cx_i^2 - dx_i^3, \quad i = 0, 1, \cdots n-1.$$

Taking mean values of the approximations indicated in equations (15), we have the following formulas for the determination of parameters:

$$d = \Big[\sum_{i=0}^{i=n-3k-1} \Delta_k^3 Y_i\Big] : [6k^3(n-3k)\Delta x^3].$$

$$c = \Big[\sum_{i=0}^{i=n-2k-1} \Delta_k^2 Y_i - 6dk^2\Delta x^2 \sum_{i=0}^{i=n-2k-1}(x_i + k\Delta x)\Big] : [2k^2(n-2k)\Delta x^2].$$

(16)
$$b = \Big[\sum_{i=0}^{i=n-k-1} \Delta_k Y_i - ck\Delta x \sum_{i=0}^{i=n-k-1}(2x_i + k\Delta x)$$
$$- dk\Delta x \sum_{i=0}^{i=n-k-1}(3x_i^2 + 3x_i - k\Delta x + k^2\Delta x^2)\Big] : [k(n-k)\Delta x].$$

$$a = \Big[\sum_{i=0}^{i=n-1} Y_i - b\sum_{i=0}^{i=n-1} x_i - c\sum_{i=0}^{i=n-1} x_i^2 - d\sum_{i=0}^{i=n-1} x_i^3\Big] : n.$$

$$4k = n \pm j, \qquad j = 0, 1, 2, \text{ or } 3.$$

VIII. Hyperbolic Series

Let us write the hyperbolic series

(1) $$y_i = a + bx_i + c : (x_i + 1)$$

Giving the increment $k\Delta x$ to x, we have

(2) $$y_{i+k} = a + b(x_i + k\Delta x) + c : (x_i + 1 + k\Delta x)$$

By subtraction, we have

(3) $$\Delta_k y_i = bk\Delta x - ck\Delta x : \big((x_i + 1)(x_i + 1 + k\Delta x)\big)$$

Giving a second increment $k\Delta x$ to x, we obtain

$$\Delta_k y_{i+k} = bk\Delta x - ck\Delta x : \left((x_i+1+k\Delta x)\ (x_i+1+2k\Delta x)\right). \tag{4}$$

By subtraction, we obtain

$$\Delta_k^2 y_i = 2ck^2\Delta x^2 : \left((x_i+1)\ (x_i+1+2k\Delta x)\right). \tag{5}$$

Making the substitutions $x_i' = (x_i+1)\ (x_i+1+k\Delta x)$, and $x_i'' = (x_i+1+2k\Delta x)$, we have, from equations (5), (3), and (1), the following parametric approximations:

$$c_i = (x_i''\ \Delta_k^2 Y_i) : (2k^2\Delta x^2), \quad i = 0, 1, \cdots n-2k-1.$$

$$b_i = (\Delta_k Y_i + ck\Delta x : x_i') : (k\Delta x), \quad i = 0, 1, \cdots n-k-1. \tag{6}$$

$$a_i = Y_i - bx_i - c : (x_i+1), \quad i = 0, 1, \cdots n-1.$$

By taking mean values of the approximations indicated in equations (6), we have the following formulas for determining parameters:

$$c = \left[\sum_{i=0}^{i=n-2k-1} x_i''\Delta_k^2 Y_i\right] : \left[2k^2(n-2k)\Delta x^2\right].$$

$$b = \left[\sum_{i=0}^{i=n-k-1} \Delta_k Y_i + ck\Delta x\left(\sum_{i=0}^{i=n-k-1} 1/x_i'\right)\right] : \left[k(n-k)\Delta x\right]. \tag{7}$$

$$a = \left[\sum_{i=0}^{i=n-1} Y_i - b\sum_{i=0}^{i=n-1} x_i - c\sum_{i=0}^{i=n-1}(x_i+1)^{-1}\right] : n.$$

$$3k = n \pm j, \quad j = 0, 1, \text{ or } 2.$$

If the coefficient of x in (1) is zero, we have simply

$$y_i = a + b : (x_i+1). \tag{8}$$

Formulas (7) now reduce to

$$b = -\left[\sum_{i=0}^{i=n-k-1} x_i'\Delta_k Y_i\right] : \left[k(n-k)\Delta x\right].$$

$$a = \left[\sum_{i=0}^{i=n-1} Y_i - b\sum_{i=0}^{i=n-1}(x_i+1)^{-1}\right] : n. \tag{9}$$

$$2k = n \pm j \quad j = 0 \text{ or } 1.$$

It is evident that a term in x^2 or x^3 could be added to equation (1) and a solution be obtained by a direct extension of the general method of analysis applied to equation (1).

IX. Logarithmic Series

Let us write the logarithmic equation

$$(1) \qquad y_i = a + b\,x_i + c \cdot \log\,(x_i + 1).$$

Giving x the increment $k\Delta x$, we have

$$(2) \qquad y_{i+k} = a + b\,(x_i + k\Delta x) + c \cdot \log\,(x_i + 1 + k\Delta x).$$

Subtracting (1) from (2), we get

$$(3) \qquad \Delta_k y_i = bk\Delta x + c\Delta_k \log\,(x_i + 1).$$

Giving to x a second increment $k\Delta x$, we get

$$(4) \qquad \Delta_k y_{i+k} = bk\Delta x + c\Delta_k \log(x_i + 1 + k\Delta x).$$

TABLE II

Deaths from Typhoid Fever in Greater City of New York

(Number of deaths per 1,000,000 inhabitants)

$y = -143.899 + 8.695\,x - 206.652\,\Gamma x$

Year	Y	y	v	Year	Y	y	v
1911	111.7	152.6	-40.9	1919	21.8	25.6	- 3.8
1912	100.5	99.3	1.2	1920	24.2	24.8	- 0.6
1913	72.0	71.7	0.3	1921	21.3	25.1	- 3.8
1914	65.0	54.7	10.3	1922	22.1	26.0	- 3.9
1915	63.5	43.4	20.1	1923	23.6	27.4	- 3.8
1916	40.6	35.8	4.8	1924	30.0	29.6	0.4
1917	42.4	30.7	11.7	1925	31.9	32.1	- 0.2
1918	35.6	27.4	8.2				
Σ					706.2	706.2	0.0

Mean error of estimate 7.6

Subtracting (3) from (4), we obtain

$$(5)\quad \Delta_k^2 y_i = c\,\Delta_k^2 \log(x_i+1).$$

From equations (5), (3), and (1), we have the following approximations to parameters:

$$c_i = \Delta_k^2 Y_i : \Delta_k^2 \log(x_i+1),\quad i=0,1,\cdots n-2k-1.$$

$$(6)\quad b_i = \Delta_k Y_i - c\Delta_k \log(x_i+1),\quad i=0,1,\cdots n-k-1.$$

$$a_i = Y_i - bx_i - c\cdot\log(x_i+1),\quad i=0,1,\cdots n-1.$$

Taking mean values of the approximations indicated in equations (6), we have the following formulas for the determination of parameters:

$$c=\Big[\sum_{i=0}^{i=n-2k-1}\big(\Delta_k^2 Y_i : \Delta_k^2 \log(x_i+1)\big)\Big] : [n-2k].$$

$$b=\Big[\sum_{i=0}^{i=n-k-1}\Delta_k Y_i - c\sum_{i=0}^{i=n-k-1}\Delta_k \log(x_i+1)\Big] : [k(n-k)\Delta x].$$

$$(7)\qquad a=\Big[\sum_{i=0}^{i=n-1} Y_i - b\sum_{i=0}^{i=n-1} x_i - c\sum_{i=0}^{i=n-1}\log(x_i+1)\Big] : n.$$

$$3k = n\pm j,\quad j=0,1,\text{ or }2$$

If the coefficient of x in equation (1) is zero, we have

$$(8)\quad y_i = a + b\cdot\log(x_i+1).$$

Formulas (7) then reduce to

$$b=\Big[\sum_{i=0}^{i=n-k-1}\big(\Delta_k Y_i : \Delta_k \log(x_i+1)\big)\Big] : [n-k].$$

$$(9)\quad a=\Big[\sum_{i=0}^{i=n-1} Y_i - b\sum_{i=0}^{i=n-1}\log(x_i+1)\Big] : n.$$

$$2k = n\pm j,\quad j=0\text{ or }1$$

X. General Polynomial Series

The solutions of polynomials presented in the preceding sections, while best for the series considered, are too specialized in mode of analysis for application to polynomials generally. We shall now develop a solution which is applicable to any polynomial in $z=f(x)$, $f(x)$ being a function of x whose value is known, as for example, x^{-1}, $\log x$, $\tan x$, etc.

We write

(1) $y_i = d+cz_i+bz_i^2+az_i^3$.

Giving to z_i the increment $\Delta_\kappa z_i$, we have

(2) $y_{i+\kappa}= d+cz_{i+\kappa}+bz_{i+\kappa}^2+az_{i+\kappa}^3$.

Subtracting (1) from (2), we get

(3) $\Delta_\kappa y_i = c\Delta_\kappa z_i+b\Delta_\kappa z_i^2+a\Delta_\kappa z_i^3$.

This is the i^{th} equation $\Delta_\kappa y$. We write the $i+k^{th}$ equation as

(4) $\Delta_\kappa y_{i+\kappa}= c\Delta_\kappa z_{i+\kappa}+b\Delta_\kappa z_{i+\kappa}^2+a\Delta_\kappa z_{i+\kappa}^3$.

Multiplying (3) by $\Delta_\kappa z_{i+\kappa}$ and (4) by $\Delta_\kappa z_i$ and then subtracting (4) from (3), we obtain

(5) $\Delta'_\kappa y_i= b\Delta'_\kappa z_i^2+a\Delta'_\kappa z_i^3$,

where $\Delta'_\kappa y_i=\Delta_\kappa y_i\cdot\Delta_\kappa z_{i+\kappa}-\Delta_\kappa y_{i+\kappa}\cdot\Delta_\kappa z_i$; $\Delta'_\kappa z_i^2=\Delta_\kappa z_i^2\cdot\Delta_\kappa z_{i+\kappa}-\Delta_\kappa z_{i+\kappa}^2\cdot\Delta_\kappa z_i$;

and $\Delta'_\kappa z_i^3=\Delta_\kappa z_i^3\cdot\Delta_\kappa z_{i+\kappa}-\Delta_\kappa z_{i+\kappa}^3\cdot\Delta_\kappa z_i$.

In (5), we have the $i\,th$ equation $\Delta'_\kappa y$. We write the $i+k^{th}$ equation as

(6) $\Delta'_\kappa y_{i+\kappa}= b\Delta'_\kappa z_{i+\kappa}^2+a\Delta'_\kappa z_{i+\kappa}^3$.

Multiplying (5) by $\Delta'_\kappa z_{i+\kappa}^2$ and (6) by $\Delta'_\kappa z_i^2$ and subtract-

ing the latter result from the former, we obtain

$$\Delta''_k y_i = a\,\Delta''_k z_i^3 , \tag{7}$$

where $\Delta''_k y_i = \Delta'_k y_i \cdot \Delta'_k z_{i+k}^2 - \Delta'_k y_{i+k} \cdot \Delta'_k z_i^2$;

and $\Delta''_k z_i^3 = \Delta'_k z_i^3 \cdot \Delta'_k z_{i+k}^2 - \Delta'_k z_{i+k}^3 \cdot \Delta'_k z_i^2$.

From equations (7), (5), (3), and (1), we are now able to write the following parametric approximations:

$$\begin{aligned}
a_i &= \left[\Delta''_k Y_i\right] : \left[\Delta''_k z_i^3\right], \quad i=0,\ 1,\ \cdots\ n-3k-1 . \\
b_i &= \left[\Delta'_k Y_i - a\Delta'_k z_i^3\right] : \left[\Delta'_k z_i^2\right], \quad i=0,\ 1,\ \cdots\ n-2k-1 . \\
c_i &= \left[\Delta_k Y_i - b\Delta_k z_i^2 - c\Delta_k z_i^3\right] : \left[\Delta_k z_i\right], \quad i=0,\ 1,\ \cdots\ n-k-1 . \\
d_i &= Y_i - cz_i - bz_i^2 - az_i^3, \quad i=0,\ 1,\ \cdots\ n-1
\end{aligned} \tag{8}$$

When $z_0 = \pm\infty$, i takes the values 1, 2, ... $n-rk-1$, r being the number of reductions essential to the approximation.

The mean values of equations (8) give the following determinations:

$$\begin{aligned}
a &= \left[a_0 + a_1 + \cdots + a_{n-3k-1}\right] : \left[n-3k\right]. \\
b &= \left[b_0 + b_1 + \cdots + b_{n-2k-1}\right] : \left[n-2k\right]. \\
c &= \left[c_0 + c_1 + \cdots + c_{n-k-1}\right] : \left[n-k\right]. \\
d &= \left[\sum_{i=0}^{i=n-1} Y_i - c\sum_{i=0}^{i=n-1} z_i - b\sum_{i=0}^{i=n-1} z_i^2 - a\sum_{i=0}^{i=n-1} z_i^3\right] : n .
\end{aligned} \tag{9}$$

If equation (1) is simplified to

$$y_i = c + bz_i + az_i^2 , \tag{10}$$

the parametric approximations become the following:

$$a_i=\left[\Delta'_k Y_i\right] : \left[\Delta'_k z_i^2\right], \quad i=0, 1, \cdots n-2k-1.$$

$$b_i=\left[\Delta_k Y_i - a\Delta_k z_i^2\right] : \left[\Delta_k z_i\right], \quad i=0, 1, \cdots n-k-1. \tag{11}$$

$$c_i= Y_i - bz_i - az_i^2, \quad i=0, 1, \cdots n-1.$$

The mean values of these approximations give the parameters sought.

XI. Exponential Series

We shall now write the equation of the exponential series

$$y_i= d+cx_i+be^{ax_i}. \tag{1}$$

Giving to x the increment $k\Delta x$, we have

$$y_{i+k}=d+c\,(x_i+k\Delta x)+be^{a(x_i+k\Delta x)}. \tag{2}$$

Subtracting (1) from (2), we get

$$\Delta_k y_i = ck\Delta x+bhe^{ax_i}, \tag{3}$$

where $h=e^{ak\Delta x}-1$.

Giving to x a second increment $k\Delta x$ we obtain

$$\Delta_k y_{i+k}=ck\Delta x+bhe^{a(x_i+k\Delta x)}. \tag{4}$$

Subtracting (3) from (4), we obtain

$$\Delta_k^2 y_i= bh^2e^{ax_i} \tag{5}$$

Taking logarithms, we have

$$\log\Delta_k^2 y_i = \log\,(bh^2)+ax_i \tag{6}$$

Again giving x the increment $k\Delta x$, we have

$$\log\Delta_k^2 y_{i+k}=\log\,(bh^2)+a\,(x_i+k\Delta x). \tag{7}$$

Subtracting (6) from (7), we obtain

$$(8) \qquad \Delta_k \log \Delta_k^2 y_i = a k \Delta x$$

From equations (8), (5), (3), and (1), we form the following parametric approximations:

$$a_i = (\Delta_k \log \Delta_k^2 Y_i) : (k\Delta x), \quad i = 0, 1, \cdots n-3k-1.$$

$$b_i = (\Delta_k^2 Y_i) : (h^2 e^{ax_i}), \quad i = 0, 1, \cdots n-2k-1.$$

$$(9) \qquad c_i = (\Delta_k Y_i - bhe^{ax_i}) : (k\Delta x), \quad i = 0, 1, \cdots n-k-1.$$

$$d_i = Y_i - cx_i - be^{ax_i}, \quad i = 0, 1, \cdots n-1.$$

Taking mean values of the approximations indicated in equations (9), we have the following formulas for determining parameters:

$$a = \left[\sum_{i=0}^{i=n-3k-1} \Delta_k \log \Delta_k^2 Y_i\right] : \left[k(n-3k)\Delta x\right].$$

$$b = \left[\sum_{i=0}^{i=n-2k-1} (\Delta_k^2 Y_i : e^{ax_i})\right] : \left[h^2(n-2k)\right].$$

$$(10) \qquad c = \left[\sum_{i=0}^{i=n-k-1} \Delta_k Y_i - bh \sum_{i=0}^{i=n-k-1} e^{ax_i}\right] : \left[k(n-k)\Delta x\right].$$

$$d = \left[\sum_{i=0}^{i=n-1} Y_i - c\sum_{i=0}^{i=n-1} x_i - b\sum_{i=0}^{i=n-1} e^{ax_i}\right] : n$$

If, in equation (1), the coefficient of x is zero, we have

$$(11) \qquad y_i = c + be^{ax_i},$$

and the formulas for determining parameters become

$$a = \left[\sum_{i=0}^{i=n-2k-1} \Delta_k \log \Delta_k Y_i\right] : \left[k(n-2k)\Delta x\right].$$

$$(12) \qquad b = \left[\sum_{i=0}^{i=n-k-1} (\Delta_k Y_i : e^{ax_i})\right] : \left[h(n-k)\right].$$

$$c = \left[\sum_{i=0}^{i=n-1} Y_i - b\sum_{i=0}^{i=n-1} e^{ax_i}\right] : n.$$

XII. Logistic Series

Let us write the equation of the logistic series

$$(1) \qquad y_i = [d + cx_i] : [1 + be^{ax_i}].$$

Multiplying by the denominator on the right and transposing, we get

$$(2) \qquad y_i = d + cx_i - by_i e^{ax_i}.$$

Giving to x the increment $k\Delta x$, we have

$$(3) \qquad y_{i+k} = d + cx_{i+k} - by_{i+k} e^{ax_{i+k}}$$

Subtracting (2) from (3), we get

$$(4) \qquad \Delta_k y_i = ck\Delta x - by_{i+k} e^{ax_{i+k}} + by_i e^{ax_i}.$$

Again giving to x the increment $k\Delta x$, we obtain

$$(5) \qquad \Delta_k y_{i+k} = ck\Delta x - by_{i+2k} e^{ax_{i+2k}} + by_{i+k} e^{ax_{i+k}}$$

Subtracting (4) from (5), we have

$$(6) \qquad \begin{aligned} \Delta_k^2 y_i &= -by_{i+2k} e^{ax_{i+2k}} + 2by_{i+k} e^{ax_{i+k}} - by_i e^{ax_i} \\ &= -be^{ax_i}(y_{i+2k} e^{a2k\Delta x} - 2y_{i+k} e^{ak\Delta x} + y_i). \end{aligned}$$

If, in (6), we give to x the increment $k\Delta x$, we get

$$(7) \qquad \begin{aligned} \Delta_k^2 y_{i+k} &= -by_{i+3k} e^{ax_{i+3k}} + 2by_{i+2k} e^{ax_{i+2k}} - by_{i+k} e^{ax_{i+k}} \\ &= -be^{ax_i}(y_{i+3k} e^{a3k\Delta x} - 2y_{i+2k} e^{a2k\Delta x} + y_{i+k} e^{ak\Delta x}) \end{aligned}$$

On dividing (7) by (6) and multiplying the quotient on the right by the parenthetical expression of (3), we have

$$(8) \qquad \begin{aligned} &p_k \Delta_k^2 y_i (y_{i+2k} e^{a2k\Delta x} - 2y_{i+k} e^{ak\Delta x} y_i) \\ &= y_{i+3k} e^{a3k\Delta x} - 2y_{i+2k} e^{a2k\Delta x} + y_{i+k} e^{ak\Delta x}. \end{aligned}$$

TABLE III

Population of Ohio

U. S. Census Count Interpolated to January 1; Unit, 1.000 persons

$$y = 91.8\ (1 + e^{.6026607 + 2.910267 \log \sin x})$$

Year	Y	y	v	Year	Y	y	v
1800	41.2	91.8	+ 50.6	1870	2651.8	2751.3	+ 99.5
1810	219.7	319.8	+100.1	1880	3175.9	3237.2	+ 61.3
1820	560.3	639.3	+ 79.0	1890	3652.7	3738.1	+ 85.4
1830	922.9	1005.6	+ 82.7	1900	4137.4	4252.5	+115.1
1840	1495.3	1405.6	− 89.7	1910	4749.3	4778.9	+ 29.6
1850	1961.3	1832.8	−128.5	1920	5759.4	5316.0	−443.4
1860	2324.5	2282.3	− 42.2				
Σ					31651.7	31651.2	− 0.5

Mean error of estimate 108.2

Predicted Population

Year	1930	1940	1950	1960	1970	1980
Population	6306	6862	7425	7996	8573	9156

Simplifying (8), we have

$$(9)\qquad y_{i+3k}\, e^{3k\Delta x} - y_{i+2k}\,(2 + p_k \Delta_k^2 y_i)\, e^{2k\Delta x} + y_{i+k}\,(1 + 2p_k \Delta_k^2 y_i) e^{k\Delta k} - y_i\, p_k \Delta_k^2 y_i = 0$$

Equation (9) is evidently cubic in $e^{k\Delta x}$, and its roots are to be found by conventional methods, care being taken to select the root which will give the parametric approximation most consistent with the hypotheses under which the function is being fitted.

From equations (9), (6), (4), and (1), we are able to form the

following approximations to parameters:

$$a_i=\left[\log e^{\alpha k\Delta x}\right]:\left[k\Delta x\right] \quad , \quad i=0,\ 1,\ \cdots n-3k-1 .$$

$$b_i=\left[\Delta_k^2 Y_i\right]:\left[-Y_{i+2k}e^{\alpha x_{i+2k}}+2Y_{i+k}e^{\alpha x_{i+k}}-Y_i e^{\alpha x_i}\right],\ i=0,1,\cdots n-2k-1.$$

(10)

$$c_i=\left[\Delta_k Y_i+bY_{i+k}e^{\alpha x_{i+k}}-bY_i e^{\alpha x_i}\right]:\left[k\Delta x\right],\ i=0,\ 1,\ \cdots n-k-1.$$

$$d_i=Y_i+bY_i e^{\alpha x_i}-cx_i, \qquad i=0,\ 1,\ \cdots n-1 .$$

The mean values of the indicated approximations give the best values of the parameters sought.

If, in equation (1), the coefficient of x is zero, we have the Verhulst logistic,

(11) $y_i=c:\left(1+be^{\alpha x_i}\right).$

The solution of this equation by the method of analysis applied to equation (1) leads eventually to the following:

(12) $y_{i+2k}e^{\alpha 2k\Delta x}-y_{i+k}\left(1+p_k\Delta_k y_i\right)e^{\alpha k\Delta x}+y_i p_k\Delta_k y_i=0.$

which is evidently quadratic in $e^{\alpha k\Delta x}$.

The parametric approximations take the form

$$a_i=\left[\log e^{\alpha k\Delta x}\right]:\left[k\Delta x\right],\quad i=0,\ 1,\ \cdots n-2k-1.$$

(13) $$b_i=-\left[\Delta_k Y_i\right]:\left[Y_{i+k}e^{\alpha x_{i+k}}-Y_i e^{\alpha x_i}\right],\quad i=0,\ 1,\ \cdots n-k-1.$$

$$c_i=Y_i+bY_i e^{\alpha x_i}\ ,\ i=0,\ 1,\ \cdots n-1 .$$

The mean values of these approximations give the values of parameters.

The Verhulst logistic may also be solved by applying formulas (12), section XI, to the ordinates $1/Y_i$, the solution being for $1/c$,

b/c, and a. Similarly, a solution for the serial equation

$$y_i = d : \left[1 + cx_i + be^{ax_i} \right] \tag{14}$$

may be had by applying formulas (10), section XI, to the ordinates $1/Y_i$, the solution giving the values of $1/d$, c/d, b/d, and a.

To solve for certain other series which are of interest, we write

$$y_i = m e^{be^{ax_i}} \tag{15}$$

The solution is obtained by applying formulas (12), section XI, to the ordinates log Y_i.

We have also

$$y_i = y_0 \left(1 + e^{b + az_i}\right) = y_0 + Be^{az_i} \tag{16}$$

where $B = y_0 e^b$, and the argument $z = f(x)$ is chosen so that $az_0 = -\infty$. This condition is met when $f(x)$ takes the form $1/x$, $\log x$, $\cot x$, $\log \sin x$, etc., the sign of a being sometimes plus and sometimes minus.

From (16), by forming the function $u_i = y_i - y_0$, we get

$$\log u_i = B + az_i . \tag{17}$$

On taking a first difference of rank k, this becomes

$$\Delta_k \log u_i = a \Delta_k z_i . \tag{18}$$

From equations (18), (17), and (16), we deduce the following parametric approximations:

$$a_i = \Delta_k \log U_i : \Delta_k z_i , \qquad i = 1, 2, \cdots n-k-1 .$$

$$\log B_i = \log U_i - az_i , \qquad i = 1, 2, \cdots n-1 . \tag{19}$$

$$Y_{0i} = Y_i - Be^{az_i} , \qquad i = 0, 1, \cdots n-1 .$$

The mean values of a_i, B_i, and y_0 give the values of the parameters sought.

If a term in x is added to the exponent of equation (16), we have

$$(20) \qquad y_i = y_0 \left(1+e^{c+bx_i+ax_i^2}\right).$$

The solution for these is obtained by carrying the analysis applied to equation (16) to second order differences and applying formulas (7), section IX, to the ordinates $\log u_i$.

If equation (20) is rewritten as

$$(21) \qquad y = y_0 \left(1+\varepsilon^{c+bx_i+ax_i^2}\right),$$

The solution is obtained by applying formulas (11), section X, to the ordinates $\log U_i$. This solution holds, it will be noted, only when the signs of b and a are such that $bx_0=ax_0^2=-\infty$.

XIII. Determination of the Rank of Differences

In the writing of formulas for the determination of parameters, the rank of differences has been fixed in a purely arbitrary manner. We shall now give a rational justification for the rank assigned.

In what follows, we shall speak of the process by which one of the parameters is eliminated from the equation of the function $y=f(x)$ as a *reduction*; and the definition shall be understood to hold whether the reduction takes place through a simple difference Δy, a logarithmic difference $\Delta \log y$, a product difference $\Delta' y$, or a ratio ρy, the rank of the reduction being the same as the rank of the difference or ratio involved. In this, we interpret $\Delta_k^s \log \Delta_k^r y$ and $\Delta_k^s \rho_k^r y$ as determining reductions of order $s+r$.

The process by which a first parameter is eliminated we shall call a first reduction; that by which a second is eliminated, a second reduction; and so on to the r th reduction. The process by which the last but one of the parameters of the original function is eliminated we shall term the *ultimate reduction*; and the parameter definied by the ultimate reduction we shall term the *ultimate parameter*.

Now, a little thought or experimentation will quickly reveal that, for any ultimate parametric approximation, the value of the approx-

imation will vary with the rank of the reduction from which it results; for, regarding a parameter as a statistical characteristic of a series of observations, when the rank of a parametric approximation is at a minimum, or when $k = 1$, the given approximation, viewed as a single instance of a number of possible approximations, is least characteristic of the complete series; and when the rank of the given approximation is at a maximum, or when $k = n - r$, the approximation, again viewed as a single instance of a number of possible approximations, is most characteristic of the complete series.

All this, of course, assumes, as we have always done in writing the equations of parametric approximations, that approximations are written in terms of the observational ordinates Y_i; for, if approximations are written in terms of the functional ordinates y_i, the value of the parameter is independent of the rank of the reduction, a fact which follows from the manner of deriving the equation defining the ultimate parameter.

Since, then, the value and representative character of an ultimate parameter varies with the rank of the reduction by which it is defined, we may, when the ultimate reduction is of the first order, express the weight of an approximation by the relation

$$(1) \qquad w_k \ (p_i) = k .$$

Here $w_k \ p_i$ is used as the arbitrary symbol for the weight of a parametric approximation defined of first order and rank k.

Suppose, now, that the given ultimate parameter is arrived at by two reductions, the first of rank k and the second of rank h. Clearly, the value of the approximation will, in this case, vary with h as well as k. Under these conditions, the weight of the approximation is expressed by the relation

$$(2) \qquad w^2_{k,h} (p_i) = k \cdot h$$

Here, the symbol $w^2_{k,h} (p_i)$ denotes the weight of a parametric approximation involving a second reduction and the ranks k and h.

Similarly, we have

$$(3) \qquad w^3_{k,h,t} (p_i) = k \cdot h \cdot f .$$

Evidently, by a direct extension of our method of induction, we arrive at the general relation

$$(4) \qquad w^{r}_{k^1, k^2, \cdots k^r}(p_i) = k_1 \cdot k_2 \cdot \cdots \cdot k_r .$$

In the derivation of all formulas, it has been assumed that k is constant for all reductions; hence, equations (2), (3), and (4) become

$$(5) \qquad w^{2}_{k}(p_i) = k \cdot k = k^2$$

$$(6) \qquad w^{3}_{k}(p_i) = k \cdot k \cdot k = k^3$$

$$(7) \qquad w^{r}_{k}(p_i) = k^r$$

Giving verbal expression to the relation (7), we say that the weight of a parametric approximation involving a reduction of the r th order and k th rank is equal to the r th power of k.

We have already shown, section V, that the number of differences of order r and rank k which can be formed from n observations is $n - rk$; likewise, the number of parametric approximations which can be formed when reductions are of the r th order, is $n - rk$; and, since the reliability of a parameter as determined from a formula must vary with the number as well as the weight of the several approximations, we may write the following equation, conditioning the reliability of the ultimate parameter p:

$$(8) \qquad \psi(p) = k^r(n - rk).$$

Regarding k as a continuous variable, we may obtain the condition for $\psi(p) = a$ maximum by differentiating ψ with respect to k, thus:

$$(9) \qquad D_k \psi(p) = nrk^{r-1} - r(r+1)k^r .$$

Setting (9) equal to zero and solving, we have

$$(10) \qquad k = n : (r+1) ,$$

That $\psi(p)$ is a maximum and not a minimum when k is determined from equation (10) is shown by taking the second derivative

of ψ and substituting for k, thus:

$$(11)\qquad D_k^2\psi(\rho)=r(r-1)nk^{r-2}-r^2(r+1)k^{r-1}=$$
$$rk^{r-2}\left((r-1)n-r(r+1)n:(r+1)\right)=-rnk^{r-2},$$

which is negative, since r, n, and k are positive.

Equation (10) may give fractional values of k; but, in practice, k is always integral; hence, we write (10) in the form

$$(12)\qquad k=(n\pm j):(r+1).$$

This is the relation from which we have determined the value of k in the writing of formulas.

We may now formulate the following rule for the determination of the rank of differences: *When the equation defining an ultimate parameter involves a reduction of order* r *and rank* k, *the value of* k *is to be obtained from the relation* $k=(n\pm j):(r+1)$, j *being assigned the smallest integral value that will make* $n\pm j$ *an exact multiple of* k. In case $n+j=n-j$, that value of k is taken which gives the highest value for $\psi(\rho)$ when k is substituted in equation (8).

XIV. Numerical Computations

In carrying through the numerical computations prescribed by formulas developed in this memoir, the following abridgments are useful in the summation of differences:

$$(1a)\qquad \sum_{i=0}^{i=n-k-1}\Delta_k Y_i=\sum_{i=0}^{i=n-k-1}(Y_{i+k}-Y_i)$$

$$(1b)\qquad =\sum_{i=0}^{i=n-k-1}Y_{i+k}-\sum_{i=0}^{i=n-k-1}Y_i$$

$$(1c)\qquad =\sum_{i=k}^{i=n-1}Y_i-\sum_{i=0}^{i=n-k-1}Y_i$$

$$(1d)\qquad =\sum_{i=n-k}^{i=n-1}Y_i-\sum_{i=0}^{i=k-1}Y_i.$$

$$(2a)\qquad \sum_{i=0}^{i=n-2k-1}\Delta_k^2 Y_i=\sum_{i=0}^{i=n-2k-1}(Y_{i+2k}-2Y_{i+k}+Y_i)$$

$$(2b)\qquad =\sum_{i=0}^{i=n-2k-1}Y_{i+2k}-2\sum_{i=0}^{i=n-2k-1}Y_{i+k}+\sum_{i=0}^{i=n-2k-1}Y_i$$

$$(2c)\qquad =\sum_{i=2k}^{i=n-1}Y_i-2\sum_{i=k}^{i=n-k-1}Y_i+\sum_{i=0}^{i=n-2k-1}Y_i$$

(2d) $$= \sum_{i=n-k}^{i=n-1} Y_i - 2\sum_{i=n-2k}^{i=2k-1} Y_i + \sum_{i=0}^{i=k-1} Y_i \ .$$

(3a) $$\sum_{i=0}^{i=n-3k-1} \Delta_k^3 Y_i = \sum_{i=0}^{i=n-3k-1} Y_i (Y_{i+3k} - 3Y_{i+2k} + 3Y_{i+k} + Y_i)$$

(3b) $$= \sum_{i=0}^{i=n-3k-1} Y_{i+3k} - 3\sum_{i=0}^{i=n-3k-1} Y_{i+2k} + 3\sum_{i=0}^{i=n-3k-1} Y_{i+k} - \sum_{i=0}^{i=n-3k-1} Y_i$$

(3c) $$= \sum_{i=3k}^{i=n-1} Y_i - 3\sum_{i=2k}^{i=n-k-1} Y_i + 3\sum_{i=k}^{i=n-2k-1} Y_i - \sum_{i=0}^{i=n-3k-1} Y_i$$

(3d) $$= \sum_{i=n-k}^{i=n-1} Y_i - 3\sum_{i=n-2k}^{i=3k-1} Y_i + 3\sum_{i=n-3k}^{i=2k-1} Y_i - \sum_{i=0}^{i=k-1} Y_i \ .$$

These relations evidently apply quite generally to the summation of differences. They may also be used to check the accuracy of differences formed. When j is positive in the relation $(r+1)k = n \pm j$, equations (c) are most convenient; when j is negative, equations (d) are most convenient.

A useful check on the product difference Δ' employed in section X is obtained as follows:

(4) $$\Delta_k Y_i + \Delta_k z_i + \Delta_k z_i^2 + \Delta_k z_i^3 = S_i \ .$$

(5) $$\Delta_k Y_{i+k} + \Delta_k z_{i+k} + \Delta_k z_{i+k}^2 + \Delta_k z_{i+k}^3 = S_{i+k} \ .$$

Multiplying (4) by $\Delta_k z_{i+k}$ and (5) by $\Delta_k z_i$, we have

(6) $$\Delta_k Y_i \cdot \Delta_k z_{i+k} + \Delta_k z_i \cdot \Delta_k z_{i+k} + \Delta_k z_i^2 \cdot \Delta_k z_{i+k} + \Delta_k z_i^3 \cdot \Delta_k z_{i+k} = S_i \cdot \Delta_k z_{i+k} \ .$$

(7) $$\Delta_k Y_{i+k} \cdot \Delta_k z_i + \Delta_k z_{i+k} \cdot \Delta_k z_i + \Delta_k z_{i+k}^2 \cdot \Delta_k z_i + \Delta_k z_{i+k}^3 \cdot \Delta_k z_i = S_{i+k} \cdot \Delta_k z_i \ .$$

Subtracting (6) from (7), we get

(8) $$\Delta_k' Y_i + \Delta_k' z_i^2 + \Delta_k' z_i^3 = \Delta_k' S_i \ .$$

Evidently, similar relations hold for the product differences Δ'', etc.

Another check that is constantly useful in the computations is the well known relation $\Sigma a f_i = a \Sigma f_i$.

TABLE IV

Auxiliary Functions Computed in Fitting to the Ohio Population

U	$\log U$	x	$\log \sin x$	$a \log \sin x$	B_i	$B10^{ax}$
0.0	$-\infty$	0	$-\infty$	$-\infty$		
178.5	2.25164	1	− 1.75814	− 2.22212	29769	228.0
519.1	2.71525	2	− 1.45718	− 1.84173	36056	547.5
881.7	2.94532	3	− 1.28120	− 1.61931	36697	913.8
1454.1	3.16259	4	− 1.15642	− 1.46160	42091	1313.8
1920.1	3.28332	5	− 1.05970	− 1.33935	41944	1741.0
2283.3	3.35856	6	− 0.98077	− 1.23960	39642	2190.5
2610.6	3.41674	7	− 0.91411	− 1.15534	37332	2659.5
3134.7	3.49620	8	− 0.85644	− 1.08246	37902	3145.4
3611.5	3.55769	9	− 0.80567	− 1.01829	37669	3646.3
4096.2	3.61238	10	− 0.76033	− 0.96097	37441	4160.7
4708.1	3.67285	11	− 0.71940	− 0.90924	38202	4687.1
5718.2	3.75726	12	− 0.68212	− 0.86212	41627	5224.2
31116.1	39.22980		−12.43148	−15.71213	456372	30457.8

$\Delta_6 \log U$	$\Delta_6 \log \sin x$	a_i
1.16510	0.84403	1.3805
0.78095	0.60074	1.3000
0.61237	0.47553	1.2877
0.44979	0.39609	1.1356
0.38953	0.34030	1.1447
0.39870	0.29865	1.3350
3.79644	2.95534	7.5835

$a = \frac{1}{6}\Sigma a_i = 1.2639$; $B = \frac{1}{12}\Sigma B_i = 38031$;

$y_0 = \frac{1}{13}(\Sigma Y - \Sigma B 10^{ax}) = 91.8$; $b = \log B - \log y_0 = 2.61730$.

In computing the ordinates

$$y_i = a + bx_i + cx_i^2 \tag{9}$$

the following formulas are useful:

$$\Delta y_0 = (b + c\Delta x)\Delta x . \tag{10}$$

$$\Delta y_{i+1} = \Delta y_i + 2c\Delta x . \tag{11}$$

$$y_0 = a . \tag{12}$$

$$y_{i+1} = y_i + \Delta y_i . \tag{13}$$

The formulas for Σx, Σx^2, and Σx^3 are to be found in any standard reference work on statistical computations.

As illustrations of the quantities to be obtained in actual computations, we give, in Table IV, the auxiliaries computed in fitting the curve $y = y_0 (1 + e^{b+a \cdot \log \sin x})$ to the population of Ohio.

XV. Critical Review

We have now presented, at some length, the technique of fitting curves by the method of differences. The term, "method of differences" is doubtless sufficiently descriptive for general purposes; but the designation *method of mean difference functions* would better convey an idea of the chief features of the technique elaborated, namely, the dependence on functions of finite differences in the derivation of equations defining parameters and the determination of the best value of a given parameter by taking the mean of the several approximations.

The fundamental requirement of this method is that, under the procedure followed, the reliability of the parameters determined shall be a maximum. This requirement results in a sum of absolute residuals which is less than that to be obtained by the Gaussian method of least squares or the Pearsonian method of moments. Rigorous adherence to the Edgeworthian requirement that the sum of the absolute residuals shall be a minimum is, it will be observed, not a demand of the present method. It can be shown that Lipka's method of averages will give the same residuals for a linear series as the method of differ-

ences; but it does not, however, give the same results in general.

The following claims to merit may be advanced for the method of differences:

(1) The computations involved in the determination of parameters are simple and easily checked.

(2) The method permits of fitting to a wide variety of functions by the direct application of its fundamental principles.

(3) The general technique developed may be adapted to special solutions in particular cases; e. g., the solutions of parabolic series given in section VII are special cases of the solution for the general polynomial series given in section X.

(4) The parametric approximations or some function involved in their determination give a convenient test of fit. If these approximations are nearly constant or fluctuate irregularly about a central value, the implication is that the test function is appropriate to the data; if the approximations show a systematic change or trend in their values, the implication is that the test function is inappropriate.

(5) The method yields satisfactory results in practice.

That the residuals do register our failure to predict the values of the observations is undeniable; but it does not follow that the least squares definition of residuals leads to the equation of greatest value for predictive purposes; for we can scarcely hope to establish that a set of residuals determined from a small number of observations constitutes a system of normally distributed variates.

Let us now consider the logistic series

(2a) $y = m e^{-be^{-ax}}$,

(3a) $y = y_0 \left(1 + e^{b+ax}\right)$,

and

(4a) $y = m : \left[1 + be^{-ax}\right]$.

This last is the Verhulst logistic.

The origin, maximum, and point of inflection of these three functions are determined by the following relations:

$$y_o = me^{-b},$$

(2b) $$dy = abme^{-ax}e^{-be^{-ax}}dx,$$

$$d^2y = a^2bme^{-be^{-ax}}(be^{-2ax} - e^{-ax})dx^2.$$

$$y = y_o(1+e^{b-\infty}),$$

(3b) $$dy = a\beta e^{\alpha z}dz,$$

$$d^2y = \alpha^2\beta e^{\alpha z}dz^2 + a\beta e^{\alpha z}d^2z.$$

$$y_o = m : [1+b],$$

(4b) $$dy = abm[e^{-ax} : (1+be^{-ax})^2]dx,$$

$$d^2y = 2a^2b^2me^{-2ax}(1+be^{-ax})dx^2 - 2a^2bme^{-2ax}(1+be^{-ax})^2dx^2 - (1+be^{-ax})^4dx^2.$$

With the origin at $f(x_o)$ and the maximum at $f(x_\infty)$, these curves show essentially the same properties and, therefore, negate the claim of Professors Pearl and Reed to have discovered in the Verhulst type logistic the unique mathematical expression for the growth of populations. This assertion, of course, makes no statement as to the type of population which is best represented by each curve.

In fitting type (2) to the population of Ohio, we have obtained, while not an ideal fit, certainly one much better than can be obtained by fitting type (3). These results, however, serve to enhance rather than diminish the general usefulness of the logistic hypothesis as an empirical generalization of the growth of populations.

As the writer conceives it, this hypothesis may be stated as follows: *When the growth of a population is not known to be correlated with events whose sequence is definitely known, it is best represented by a*

curve which proceeds from one horizontal straight line as asymptotic origin, passes through a point of inflection, and approaches a second horizontal straight line as asymptotic terminus. The rate of growth of such a curve may be characterized as proceeding from a minimum to a maximum and then decreasing toward zero as limit, a characterization which is in full accord with our decrease in knowledge concerning the rate of growth as time goes on. It will be noted, in our statement of the logistic hypothesis, that it is not necessary to place any restriction on the chronological direction of growth, interpretation of growth as proceeding forward or backward being equally permissible.

It is, of course, true that the particular function fitted to the Ohio population does not conform rigorously to the logistic type; for at $x = 90$, the ordinates begin to decline in value. But this is no detriment in the application of the function in the particular case, since no one would place any reliance on a forecast of such date when projected several centuries into the future. The use of such a function as we have employed seems far preferable to fitting the Verhulst function to subpopulations on the ground that the sum of logistics cannot be executed itself to be a logistic, a procedure which is strictly valid only when the growth changes of the subpopulations are mutually independent.[1]

When the growth of a population is known to be definitely correlated with an observed sequence of events, the logistic hypothesis must be modified accordingly. In a region where the population could not be recruited from without, an abrupt increase in the death rate, a decrease in the birth rate, or an emigration to regions outside would necessitate a modification of the growth formula.

NOTE:—In presenting this memoir to the public, the writer desires to make grateful acknowledgement of the invaluable assistance given by his wife, Hazel J. Will, in the preparation of the manuscript.

1. cf. Pearl and Reed: "The Population of an Area Around Chicago and the Logistic Curve." J. A. A. S., March, 1929.

Harry S. Will

TABLES OF PEARSON'S TYPE III FUNCTION

By

LUIS R. SALVOSA

SECTION I.—*Development of Pearson's Type III Function*
SECTION II.—*Areas*
SECTION III.—*Ordinates*
SECTION IV.—*Derivatives**

It is well recognized that the normal curve of error has played a prominent role in the development of the theory of Mathematical Statistics. Although it can describe more or less accurately many frequency distributions possessing a limited degree of skewness, there are many others in which it fails. To meet this situation two important methods of representing frequency functions have been devised.

One of these methods is due to the English biometrician Karl Pearson, who developed a system of generalized "probability" curves. Among the simplest of these curves is Type III, whose equation is $y=y_o\left(1+\frac{\alpha_1}{2}t\right)^{\frac{2}{\alpha_1}-1}e^{-\frac{2}{\alpha_1}t}$, where y_o and α_1 are constants. It will be shown later that this curve approaches the normal curve of error as a limit when α_1 approaches zero. Pearson, realizing the importance of this generalized curve, published in 1922 his "Tables of the Incomplete Γ Function," from which the areas under the curve can be obtained. Unfortunately, these tables, unlike those of the normal curve of error, are not tabulated with the standard unit as the ordinate. Moreover, they do not contain the ordinates, which are useful in plotting frequency curves and essential to the solution of many problems in the theory of probability.

My object, therefore, is to provide tables of areas and ordinates of Pearson's Type III curve that will enable one to obtain readily an isolated frequency or the sum of the frequencies between any two

*Section IV will appear in the August issue of the ANNALS.

limits of a theoretical distribution that can be represented by the Type III curve. Furthermore, there will be furnished tables of derivatives of this more effective type of frequency function which will permit its utilization as a generating function in an expansion corresponding to the Gram-Charlier series. In general, the more closely the generating function approximates the function to be graduated, the more rapid the convergence of the derivative series. In the following section there are given two separate developments of the Pearson Type III Function. It is believed that these developments will be of value to those desiring to use this function.

SECTION I.—*Development of Pearson's Type III Function*

(*a*) *By Means of Bernoulli's Series*

One may consider first the Bernoulli series

$$(1) \qquad (q+p)^r = \sum_{x=0}^{r} \binom{r}{x} q^{r-x} p^x,$$

where p denotes the probability that an event will happen in a single trial and $q=1-p$, the probability that it will fail. Representing by $y_x = \binom{r}{x} q^{r-x} p^x$ the ordinate corresponding to x successes (x assuming the values of 0, 1, 2 . . ., r), one may plot the $(r+1)$ points (x, y_x). Through these $(r+1)$ points one may imagine a curve that can be represented by an analytic function.

Since $$y_x = \binom{r}{x} q^{r-x} p^x$$

and hence $$y_{x+1} = \binom{r}{x+1} q^{r-x-1} p^{x+1}$$

one has

$$(2) \qquad \frac{y_{x+1}}{y_x} = \frac{rp-px}{q_x+q}$$

This is the difference equation of the continuous curve.

From equation (2) it follows that

$$(3) \qquad \frac{y_{x+1}-y_x}{y_{x+1}+y_x} = \frac{rp-q-x}{rp+q+(q-p)x}$$

The mean of any two ordinates (y_x and y_{x+1}) will be considered as approximately equal to the ordinate ($y_{x+\frac{1}{2}}$) midway between them. The slope of the line joining any two points (x, y_x) and ($x+1$, y_{x+1}) is also approximately equal to the tangent at the point midway between these two on the continuous curve and the error resulting from this approximation would be zero if the curve were a parabola. Under these two assumptions, equation (3) may be written as

$$(4) \qquad \frac{D_x\, y_{x+\frac{1}{2}}}{y_{x+\frac{1}{2}}} = \frac{2(rp-q-x)}{rp+q+(q-p)x}$$

The right hand member of this equation is, therefore, the derivative of log y at the point ($x+\frac{1}{2}$, $y_{x+\frac{1}{2}}$). At any point (x, y_x) this derivative is

$$\frac{d}{dx}\log y = \frac{2\left[rp-q-(x-\frac{1}{2})\right]}{rp+q+(q-p)(x-\frac{1}{2})} ;$$

i. e.

$$(5) \qquad \frac{d}{dx}\log y = -\left[\frac{\frac{q-p}{2}+(x-rp)}{rpq+\frac{1}{4}+\frac{(x-rp)(q-p)}{2}}\right].$$

If one sets

$$\frac{q-p}{\sqrt{rpq}} = \alpha_2 ,$$

$$\frac{x-rp}{\sqrt{rpq}} = t ,$$

the above equation reduces to

$$(6) \qquad \frac{d}{dt}\log y = -\frac{\frac{\alpha_2}{2}+t}{1+\frac{\alpha_2}{2}t+\frac{1}{4rpq}}$$

If rpq is so large that $\frac{1}{4rpq}$ is relatively insignificant and may consequently be neglected, equation (6) becomes

$$(7) \qquad \frac{d}{dt}\log y = -\frac{\frac{\alpha_3}{2}+t}{1+\frac{\alpha_3}{2}t},$$

which upon integration yields Pearson's Type III frequency curve,

$$(8) \qquad y = y_0\left(1+\frac{\alpha_3}{2}t\right)^{\frac{4}{\alpha_3^2}-1} e^{-\frac{2}{\alpha_3}t}$$

Thus, equation (8) has been obtained without resorting to the method of moments.

(b) *By Means of Differential Equation*

Another method* of developing Pearson's Type III curve is by means of the differential equation

$$(9) \qquad \frac{dy}{dt} = \frac{a-t}{f(t)}\,y,$$

which is suggested by certain characteristics of unimodal frequency distributions. Equation (9) is capable of representing a frequency function of this type, since

(a) As y approaches zero, the first derivative must also approach zero, and

(b) If the frequency distribution be unimodal between the limits of the distribution, there must be only one value, say $t = a$, for which the derivative is zero.

In equation (9) t denotes the abscissae in units of the standard

*Carver's "Frequency Curves," p. 92 *Handbook of Mathematical Statistics*, by Rietz and Others.

deviation, and $f(t)$ is a function that does not vanish at any point within the range of the curve. If it be assumed that $f(t)$ is expressible as a power series, $b_0 + b_1 t + b_2 t^2 + \ldots\ldots$, then equation (9) may take the following form:

$$\frac{dy}{dt} = \frac{(a-t)y}{b_0 + b_1 t + b_2 t^2 + \ldots} \quad , \tag{10}$$

On clearing equation (10) of fractions, multiplying both sides by t^n, and integrating both members with respect to t between the limits $(-l_1, l_2)$, one obtains

$$\left[y_0 (b_0 t^n + b_1 t^{n+1} + b_2 t^{n+2} + \ldots)\right]_{-l_1}^{l_2} - \int_{-l_1}^{l_2} y\left[n b_0 t^{n-1} + (n+1) b_1 t^n + (n+2) b_2 t^{n+1} + \ldots\right] dt = \int_{-l_1}^{l_2} (a y t^n - y t^{n+1}) dt, \tag{11}$$

which can be written in the form

$$a\alpha_n + n b_0 \alpha_{n-1} + (n+1) b_1 \alpha_n + (n+2) b_2 \alpha_{n+1} + \ldots = \alpha_{n+1} \tag{12}$$

since the expression in the first bracket vanishes at the limits, and $\int_{-l_1}^{l_2} t^n y\, dt = \frac{\mu_n}{\sigma^n} = \alpha_n$ It will be noted here that $\alpha_0 = 1$, $\alpha_1 = 0$, and $\alpha_2 = 1$.

If the series $f(t)$ be so rapidly convergent that it would be sufficient to retain the first term only, then from equation (12), on placing successively $n = 0, 1, 2 \ldots$ one has

$$a = 0$$
$$b_0 = 1$$

On substituting these values in equation (10) and then integrating, one obtains

$$y = y_0 e^{-\frac{t^2}{2}} \quad , \tag{13}$$

which is the normal curve of error, t being expressed in standard units.

If in the series $f(t)$ the first two terms be retained instead of b_0 only, then equation (12) gives

$$a = -b_1 = -\frac{\alpha_3}{2} \tag{14}$$

$$b_0 = 1.$$

If the values given in equations (14) be substituted in equation (10), then upon integration one obtains

$$y = y_0 \left(1 + \frac{\alpha_3}{2} t\right)^{\frac{4}{\alpha_3^2} - 1} e^{-\frac{2}{\alpha_3} t} \tag{15}$$

This equation is the same as equation (8) and satisfies the conditions imposed, provided $\alpha_3 < \sqrt{2}$.

The substitution of the constants (14) in equation (12) yields the following recurrence relation of the functional Type III moments:

$$\alpha_{n+1} = n\left(\alpha_{n-1} + \frac{\alpha_3 \alpha_n}{2}\right). \tag{16}$$

To find the recurrence relation of the functional moments for the normal curve of error, α_3 is set equal to zero and hence relation (16) reduces to the simple relation

$$\alpha_{n+1} = n \alpha_{n-1} \tag{17}$$

since $\alpha_1 = 0$

it follows from relation (17) that

$$\alpha_{2n+1} = 0 \tag{18}$$

For the moments of even order one writes from relation (17)

$$\alpha_2 = 1$$

$$\alpha_4 = 3$$

$$\alpha_6 = 5\alpha_4$$

$$\cdots\cdots$$

$$\alpha_{2n} = 1 \cdot 3 \cdot 5 \cdots (2n-1) = \frac{(2n)!}{2^n n!}$$

The normal curve of error has been derived by retaining the first term only in the series $f(t)$. However, it can be shown that this curve is the limit of Type III curve as the skewness approaches zero. For, taking the logarithms of both sides of equation (15), one has

$$\log_e y = \log_e y_o + \left(\frac{4}{\alpha_3^2} - 1\right) \log_e \left(1 + \frac{\alpha_3}{2} t\right) - \frac{2}{\alpha_3} t ,$$

or $$\log_e \left(\frac{y}{y_o}\right) = \left(\frac{4}{\alpha_3^2} - 1\right)\left(\frac{\alpha_3}{2} t - \frac{1}{2} \cdot \frac{\alpha_3^2 t^2}{4} + \frac{1}{3} \cdot \frac{\alpha_3^3 t^3}{8} - \cdots\cdots\right) - \frac{2}{\alpha_3} t$$
$$= -\frac{1}{2} t^2 + f(\alpha_3 t) .$$

Therefore,

$$\lim_{\alpha_3 \to 0} \log_e \left(\frac{y}{y_o}\right) = -\frac{1}{2} t^2 ,$$

or

$$y = y_o e^{-\frac{1}{2} t^2} ,$$

which agrees with equation (13).

The constant y_o in equations (13) and (15) is determined imposing the condition that

$$(20) \qquad y_o \int_{-\frac{2}{\alpha_3}}^{\infty} \left(1 + \frac{\alpha_3}{2} t\right)^{\frac{4}{\alpha_3^2} - 1} e^{-\frac{2}{\alpha_3} t} \, dt = 1 .$$

On introducing z by the relation $z = \frac{2}{\alpha_3}\left(\frac{2}{\alpha_3} + t\right)$ equation (20) becomes

$$y_o = \frac{1}{\frac{\alpha_3}{2}\left(\frac{4}{\alpha_3^2}\right)^{\frac{4}{\alpha_3^2} - 1} e^{\frac{4}{\alpha_3^2}} \int_0^{\infty} z^{\frac{4}{\alpha_3^2} - 1} e^{-z} dz}$$

Therefore,

$$(21) \qquad y_o = \frac{\left(\frac{4}{\alpha_3^2}\right)^{\frac{4}{\alpha_3^2} - \frac{1}{2}}}{e^{\frac{4}{\alpha_3^2}} \Gamma\left(\frac{4}{\alpha_3^2}\right)} = n^{\frac{1}{2}} \frac{n^{n - \frac{1}{2}}}{e^n \Gamma(n)}$$

where

$$n = \frac{4}{\alpha_3^2} \quad .$$

With the aid of Sterling's formula, equation (21) can be written as

$$(22) \qquad y_o = \frac{1}{\sqrt{2\pi}}\, e^{-\frac{\alpha_3^2}{48} + \frac{\alpha_3^4}{23040} - \frac{\alpha_3^{10}}{1290240} + \cdots\cdots}$$

For the normal curve of error, that is, when $\alpha_3 = 0$, equation (22) reduces to

$$(23) \qquad y_o = \frac{1}{\sqrt{2\pi}} \quad ,$$

and hence for the foregoing specialization with respect to α_3, equation (15) becomes:

$$y = \frac{1}{\sqrt{2\pi}}\, e^{-\frac{t^2}{2}} \quad .$$

The intention was to have the Tables correct to six decimal places. To this end all computations of areas, ordinates and derivatives were carried through to eight significant digits of accuracy, which frequently meant ten or twelve decimal places. The results were then cut down to the nearest sixth decimal place, and I believe they possess this degree of accuracy.

Manila, P. I.

L. R. Salvosa

TABLE I

AREAS OF THE STANDARDIZED TYPE III FUNCTION

$$y = y_0 \left(1 + \frac{\alpha_3}{2} t\right)^{\frac{4}{\alpha_3^2} - 1} e^{-\frac{2}{\alpha_3} t}$$

t	SKEWNESS						t
	0	.1	.2	.3	.4	.5	
−4.99							−4.99
−4.98							−4.98
−4.97							−4.97
−4.96							−4.96
−4.95							−4.95
−4.94							−4.94
−4.93							−4.93
−4.92							−4.92
−4.91							−4.91
−4.90							−4.90
−4.89	.000001						−4.89
−4.88	.000001						−4.88
−4.87	.000001						−4.87
−4.86	.000001						−4.86
−4.85	.000001						−4.85
−4.84	.000001						−4.84
−4.83	.000001						−4.83
−4.82	.000001						−4.82
−4.81	.000001						−4.81
−4.80	.000001						−4.80
−4.79	.000001						−4.79
−4.78	.000001						−4.78
−4.77	.000001						−4.77
−4.76	.000001						−4.76
−4.75	.000001						−4.75
−4.74	.000001						−4.74
−4.73	.000001						−4.73
−4.72	.000001						−4.72
−4.71	.000001						−4.71
−4.70	.000001						−4.70
−4.69	.000001						−4.69
−4.68	.000001						−4.68
−4.67	.000002						−4.67
−4.66	.000002						−4.66
−4.65	.000002						−4.65
−4.64	.000002						−4.64
−4.63	.000002						−4.63
−4.62	.000002						−4.62
−4.61	.000002						−4.61
−4.60	.000002						−4.60
−4.59	.000002						−4.59
−4.58	.000002						−4.58
−4.57	.000002						−4.57
−4.56	.000003						−4.56
−4.55	.000003						−4.55
−4.54	.000003						−4.54
−4.53	.000003						−4.53
−4.52	.000003						−4.52
−4.51	.000003	.000001					−4.51
−4.50	.000003	.000001					−4.50

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
−4.99							−4.99
−4.98							−4.98
−4.97							−4.97
−4.96							−4.96
−4.95							−4.95
−4.94							−4.94
−4.93							−4.93
−4.92							−4.92
−4.91							−4.91
−4.90							−4.90
−4.89							−4.89
−4.88							−4.88
−4.87							−4.87
−4.86							−4.86
−4.85							−4.85
−4.84							−4.84
−4.83							−4.83
−4.82							−4.82
−4.81							−4.81
−4.80							−4.80
−4.79							−4.79
−4.78							−4.78
−4.77							−4.77
−4.76							−4.76
−4.75							−4.75
−4.74							−4.74
−4.73							−4.73
−4.72							−4.72
−4.71							−4.71
−4.70							−4.70
−4.69							−4.69
−4.68							−4.68
−4.67							−4.67
−4.66							−4.66
−4.65							−4.65
−4.64							−4.64
−4.63							−4.63
−4.62							−4.62
−4.61							−4.61
−4.60							−4.60
−4.59							−4.59
−4.58							−4.58
−4.57							−4.57
−4.56							−4.56
−4.55							−4.55
−4.54							−4.54
−4.53							−4.53
−4.52							−4.52
−4.51							−4.51
−4.50							−4.50

t	SKEWNESS						t
	0	.1	.2	.3	.4	.5	
−4.49	.000004	.000001					−4.49
−4.48	.000004	.000001					−4.48
−4.47	.000004	.000001					−4.47
−4.46	.000004	.000001					−4.46
−4.45	.000004	.000001					−4.45
−4.44	.000004	.000001					−4.44
−4.43	.000005	.000001					−4.43
−4.42	.000005	.000001					−4.42
−4.41	.000005	.000001					−4.41
−4.40	.000005	.000001					−4.40
−4.39	.000006	.000001					−4.39
−4.38	.000006	.000001					−4.38
−4.37	.000006	.000001					−4.37
−4.36	.000007	.000001					−4.36
−4.35	.000007	.000001					−4.35
−4.34	.000007	.000001					−4.34
−4.33	.000007	.000001					−4.33
−4.32	.000008	.000002					−4.32
−4.31	.000008	.000002					−4.31
−4.30	.000009	.000002					−4.30
−4.29	.000009	.000002					−4.29
−4.28	.000009	.000002					−4.28
−4.27	.000010	.000002					−4.27
−4.26	.000010	.000002					−4.26
−4.25	.000011	.000002					−4.25
−4.24	.000011	.000003					−4.24
−4.23	.000012	.000003					−4.23
−4.22	.000012	.000003					−4.22
−4.21	.000013	.000003					−4.21
−4.20	.000013	.000003					−4.20
−4.19	.000014	.000003					−4.19
−4.18	.000015	.000003					−4.18
−4.17	.000015	.000004					−4.17
−4.16	.000016	.000004					−4.16
−4.15	.000017	.000004	.000001				−4.15
−4.14	.000017	.000004	.000001				−4.14
−4.13	.000018	.000005	.000001				−4.13
−4.12	.000019	.000005	.000001				−4.12
−4.11	.000020	.000005	.000001				−4.11
−4.10	.000021	.000005	.000001				−4.10
−4.09	.000022	.000006	.000001				−4.09
−4.08	.000023	.000006	.000001				−4.08
−4.07	.000023	.000006	.000001				−4.07
−4.06	.000025	.000007	.000001				−4.06
−4.05	.000026	.000007	.000001				−4.05
−4.04	.000027	.000007	.000001				−4.04
−4.03	.000028	.000008	.000001				−4.03
−4.02	.000029	.000008	.000001				−4.02
−4.01	.000030	.000009	.000001				−4.01
−4.00	.000032	.000009	.000001				−4.00

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
-4.49							-4.49
-4.48							-4.48
-4.47							-4.47
-4.46							-4.46
-4.45							-4.45
-4.44							-4.44
-4.43							-4.43
-4.42							-4.42
-4.41							-4.41
-4.40							-4.40
-4.39							-4.39
-4.38							-4.38
-4.37							-4.37
-4.36							-4.36
-4.35							-4.35
-4.34							-4.34
-4.33							-4.33
-4.32							-4.32
-4.31							-4.31
-4.30							-4.30
-4.29							-4.29
-4.28							-4.28
-4.27							-4.27
-4.26							-4.26
-4.25							-4.25
-4.24							-4.24
-4.23							-4.23
-4.22							-4.22
-4.21							-4.21
-4.20							-4.20
-4.19							-4.19
-4.18							-4.18
-4.17							-4.17
-4.16							-4.16
-4.15							-4.15
-4.14							-4.14
-4.13							-4.13
-4.12							-4.12
-4.11							-4.11
-4.10							-4.10
-4.09							-4.09
-4.08							-4.08
-4.07							-4.07
-4.06							-4.06
-4.05							-4.05
-4.04							-4.04
-4.03							-4.03
-4.02							-4.02
-4.01							-4.01
-4.00							-4.00

t	SKEWNESS						t
	0	.1	.2	.3	.4	.5	
-3.99	.000033	.000010	.000002				-3.99
-3.98	.000034	.000010	.000002				-3.98
-3.97	.000036	.000011	.000002				-3.97
-3.96	.000037	.000011	.000002				-3.96
-3.95	.000039	.000012	.000002				-3.95
-3.94	.000041	.000012	.000002				-3.94
-3.93	.000042	.000013	.000002				-3.93
-3.92	.000044	.000014	.000003				-3.92
-3.91	.000046	.000014	.000003				-3.91
-3.90	.000048	.000015	.000003				-3.90
-3.89	.000050	.000016	.000003				-3.89
-3.88	.000052	.000017	.000003				-3.88
-3.87	.000054	.000018	.000004				-3.87
-3.86	.000057	.000019	.000004				-3.86
-3.85	.000059	.000020	.000004				-3.85
-3.84	.000062	.000021	.000004				-3.84
-3.83	.000064	.000022	.000005				-3.83
-3.82	.000067	.000023	.000005				-3.82
-3.81	.000069	.000024	.000005				-3.81
-3.80	.000072	.000025	.000006	.000001			-3.80
-3.79	.000075	.000026	.000006	.000001			-3.79
-3.78	.000078	.000028	.000006	.000001			-3.78
-3.77	.000082	.000029	.000007	.000001			-3.77
-3.76	.000085	.000031	.000007	.000001			-3.76
-3.75	.000088	.000032	.000008	.000001			-3.75
-3.74	.000092	.000034	.000008	.000001			-3.74
-3.73	.000096	.000035	.000009	.000001			-3.73
-3.72	.000100	.000037	.000009	.000001			-3.72
-3.71	.000104	.000039	.000010	.000001			-3.71
-3.70	.000108	.000041	.000010	.000001			-3.70
-3.69	.000112	.000043	.000011	.000001			-3.69
-3.68	.000117	.000045	.000012	.000002			-3.68
-3.67	.000121	.000047	.000012	.000002			-3.67
-3.66	.000126	.000049	.000013	.000002			-3.66
-3.65	.000131	.000052	.000014	.000002			-3.65
-3.64	.000136	.000054	.000015	.000002			-3.64
-3.63	.000142	.000057	.000016	.000002			-3.63
-3.62	.000147	.000060	.000017	.000002			-3.62
-3.61	.000153	.000062	.000018	.000003			-3.61
-3.60	.000159	.000065	.000019	.000003			-3.60
-3.59	.000165	.000068	.000020	.000003			-3.59
-3.58	.000172	.000072	.000021	.000003			-3.58
-3.57	.000178	.000075	.000023	.000004			-3.57
-3.56	.000185	.000079	.000024	.000004			-3.56
-3.55	.000193	.000082	.000025	.000004			-3.55
-3.54	.000200	.000086	.000027	.000005			-3.54
-3.53	.000208	.000090	.000028	.000005			-3.53
-3.52	.000216	.000094	.000030	.000005			-3.52
-3.51	.000224	.000099	.000032	.000006			-3.51
-3.50	.000233	.000103	.000034	.000006			-3.50

t	SKEWNESS .6	.7	.8	.9	1.0	1.1	t
-3.99							-3.99
-3.98							-3.98
-3.97							-3.97
-3.96							-3.96
-3.95							-3.95
-3.94							-3.94
-3.93							-3.93
-3.92							-3.92
-3.91							-3.91
-3.90							-3.90
-3.89							-3.89
-3.88							-3.88
-3.87							-3.87
-3.86							-3.86
-3.85							-3.85
-3.84							-3.84
-3.83							-3.83
-3.82							-3.82
-3.81							-3.81
-3.80							-3.80
-3.79							-3.79
-3.78							-3.78
-3.77							-3.77
-3.76							-3.76
-3.75							-3.75
-3.74							-3.74
-3.73							-3.73
-3.72							-3.72
-3.71							-3.71
-3.70							-3.70
-3.69							-3.69
-3.68							-3.68
-3.67							-3.67
-3.66							-3.66
-3.65							-3.65
-3.64							-3.64
-3.63							-3.63
-3.62							-3.62
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-3.58							-3.58
-3.57							-3.57
-3.56							-3.56
-3.55							-3.55
-3.54							-3.54
-3.53							-3.53
-3.52							-3.52
-3.51							-3.51
-3.50							-3.50

t	SKEWNESS						t
	0	.1	.2	.3	.4	.5	
-3.49	.000241	.000108	.000036	.000007			-3.49
-3.48	.000251	.000113	.000038	.000007			-3.48
-3.47	.000260	.000118	.000040	.000008	.000001		-3.47
-3.46	.000270	.000123	.000042	.000009	.000001		-3.46
-3.45	.000280	.000129	.000045	.000009	.000001		-3.45
-3.44	.000291	.000135	.000047	.000010	.000001		-3.44
-3.43	.000302	.000141	.000050	.000011	.000001		-3.43
-3.42	.000313	.000147	.000053	.000012	.000001		-3.42
-3.41	.000325	.000154	.000056	.000012	.000001		-3.41
-3.40	.000337	.000161	.000059	.000013	.000001		-3.40
-3.39	.000349	.000168	.000062	.000014	.000001		-3.39
-3.38	.000362	.000175	.000065	.000015	.000001		-3.38
-3.37	.000376	.000183	.000069	.000017	.000002		-3.37
-3.36	.000390	.000191	.000073	.000018	.000002		-3.36
-3.35	.000404	.000199	.000077	.000019	.000002		-3.35
-3.34	.000419	.000208	.000081	.000021	.000002		-3.34
-3.33	.000434	.000217	.000085	.000022	.000002		-3.33
-3.32	.000450	.000227	.000090	.000024	.000003		-3.32
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-3.30	.000483	.000247	.000100	.000027	.000003		-3.30
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-3.27	.000538	.000280	.000116	.000033	.000004		-3.27
-3.26	.000557	.000292	.000122	.000035	.000005		-3.26
-3.25	.000577	.000304	.000129	.000038	.000005		-3.25
-3.24	.000598	.000317	.000135	.000040	.000006		-3.24
-3.23	.000619	.000330	.000143	.000043	.000007		-3.23
-3.22	.000641	.000344	.000150	.000046	.000007		-3.22
-3.21	.000664	.000359	.000158	.000049	.000008		-3.21
-3.20	.000687	.000374	.000166	.000052	.000009		-3.20
-3.19	.000711	.000389	.000174	.000056	.000009		-3.19
-3.18	.000736	.000405	.000183	.000059	.000010		-3.18
-3.17	.000762	.000422	.000192	.000063	.000011		-3.17
-3.16	.000789	.000439	.000202	.000067	.000012	.000001	-3.16
-3.15	.000816	.000457	.000212	.000072	.000014	.000001	-3.15
-3.14	.000845	.000476	.000222	.000076	.000015	.000001	-3.14
-3.13	.000874	.000495	.000234	.000081	.000016	.000001	-3.13
-3.12	.000904	.000516	.000245	.000087	.000018	.000001	-3.12
-3.11	.000935	.000536	.000257	.000092	.000019	.000001	-3.11
-3.10	.000968	.000558	.000270	.000098	.000021	.000001	-3.10
-3.09	.001001	.000580	.000283	.000104	.000023	.000002	-3.09
-3.08	.001035	.000604	.000297	.000110	.000025	.000002	-3.08
-3.07	.001070	.000628	.000311	.000117	.000027	.000002	-3.07
-3.06	.001107	.000653	.000326	.000124	.000029	.000002	-3.06
-3.05	.001144	.000679	.000342	.000132	.000032	.000003	-3.05
-3.04	.001183	.000705	.000358	.000140	.000034	.000003	-3.04
-3.03	.001223	.000733	.000375	.000148	.000037	.000003	-3.03
-3.02	.001264	.000762	.000393	.000157	.000040	.000004	-3.02
-3.01	.001306	.000792	.000411	.000167	.000043	.000004	-3.01
-3.00	.001350	.000823	.000430	.000177	.000047	.000005	-3.00

t	SKEWNESS .6	.7	.8	.9	1.0	1.1	t
-3.49							-3.49
-3.48							-3.48
-3.47							-3.47
-3.46							-3.46
-3.45							-3.45
-3.44							-3.44
-3.43							-3.43
-3.42							-3.42
-3.41							-3.41
-3.40							-3.40
-3.39							-3.39
-3.38							-3.38
-3.37							-3.37
-3.36							-3.36
-3.35							-3.35
-3.34							-3.34
-3.33							-3.33
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-3.30							-3.30
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-3.25							-3.25
-3.24							-3.24
-3.23							-3.23
-3.22							-3.22
-3.21							-3.21
-3.20							-3.20
-3.19							-3.19
-3.18							-3.18
-3.17							-3.17
-3.16							-3.16
-3.15							-3.15
-3.14							-3.14
-3.13							-3.13
-3.12							-3.12
-3.11							-3.11
-3.10							-3.10
-3.09							-3.09
-3.08							-3.08
-3.07							-3.07
-3.06							-3.06
-3.05							-3.05
-3.04							-3.04
-3.03							-3.03
-3.02							-3.02
-3.01							-3.01
-3.00							-3.00

t	SKEWNESS 0	.1	.2	.3	.4	.5	t
−2.99	.001395	.000854	.000450	.000187	.000051	.000006	−2.99
−2.98	.001441	.000888	.000471	.000198	.000055	.000006	−2.98
−2.97	.001489	.000922	.000493	.000209	.000059	.000007	−2.97
−2.96	.001538	.000957	.000516	.000222	.000064	.000008	−2.96
−2.95	.001589	.000994	.000540	.000234	.000069	.000009	−2.95
−2.94	.001641	.001032	.000564	.000248	.000074	.000010	−2.94
−2.93	.001695	.001071	.000590	.000262	.000080	.000011	−2.93
−2.92	.001750	.001111	.000617	.000277	.000086	.000012	−2.92
−2.91	.001807	.001153	.000644	.000292	.000092	.000014	−2.91
−2.90	.001866	.001197	.000673	.000309	.000099	.000016	−2.90
−2.89	.001926	.001242	.000703	.000326	.000107	.000017	−2.89
−2.88	.001988	.001288	.000735	.000344	.000115	.000019	−2.88
−2.87	.002052	.001336	.000767	.000363	.000123	.000021	−2.87
−2.86	.002118	.001385	.000801	.000383	.000132	.000024	−2.86
−2.85	.002186	.001437	.000836	.000403	.000141	.000026	−2.85
−2.84	.002256	.001489	.000873	.000425	.000152	.000029	−2.84
−2.83	.002327	.001544	.000911	.000448	.000162	.000032	−2.83
−2.82	.002401	.001600	.000950	.000472	.000174	.000036	−2.82
−2.81	.002477	.001659	.000991	.000497	.000186	.000039	−2.81
−2.80	.002555	.001719	.001034	.000523	.000199	.000043	−2.80
−2.79	.002635	.001781	.001078	.000551	.000212	.000048	−2.79
−2.78	.002718	.001845	.001124	.000580	.000227	.000052	−2.78
−2.77	.002803	.001911	.001171	.000610	.000242	.000057	−2.77
−2.76	.002890	.001980	.001220	.000641	.000258	.000063	−2.76
−2.75	.002980	.002050	.001272	.000674	.000276	.000069	−2.75
−2.74	.003072	.002123	.001325	.000709	.000294	.000076	−2.74
−2.73	.003167	.002198	.001380	.000744	.000313	.000083	−2.73
−2.72	.003264	.002275	.001437	.000782	.000334	.000090	−2.72
−2.71	.003364	.002355	.001496	.000821	.000355	.000099	−2.71
−2.70	.003467	.002437	.001557	.000862	.000378	.000108	−2.70
−2.69	.003573	.002522	.001621	.000905	.000402	.000117	−2.69
−2.68	.003681	.002610	.001687	.000949	.000427	.000128	−2.68
−2.67	.003793	.002700	.001755	.000996	.000454	.000139	−2.67
−2.66	.003907	.002793	.001826	.001044	.000482	.000151	−2.66
−2.65	.004025	.002889	.001899	.001095	.000512	.000164	−2.65
−2.64	.004145	.002987	.001975	.001148	.000543	.000177	−2.64
−2.63	.004269	.003089	.002053	.001203	.000576	.000192	−2.63
−2.62	.004396	.003194	.002134	.001260	.000611	.000208	−2.62
−2.61	.004527	.003302	.002218	.001320	.000647	.000225	−2.61
−2.60	.004661	.003413	.002305	.001382	.000686	.000244	−2.60
−2.59	.004799	.003528	.002395	.001446	.000726	.000263	−2.59
−2.58	.004940	.003645	.002488	.001514	.000768	.000284	−2.58
−2.57	.005085	.003767	.002584	.001584	.000813	.000306	−2.57
−2.56	.005234	.003892	.002683	.001656	.000860	.000330	−2.56
−2.55	.005386	.004020	.002786	.001732	.000909	.000356	−2.55
−2.54	.005543	.004152	.002892	.001811	.000960	.000383	−2.54
−2.53	.005703	.004289	.003001	.001892	.001014	.000411	−2.53
−2.52	.005868	.004429	.003115	.001977	.001071	.000442	−2.52
−2.51	.006037	.004573	.003232	.002066	.001130	.000475	−2.51
−2.50	.006210	.004721	.003352	.002157	.001192	.000509	−2.50

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
−2.99							−2.99
−2.98							−2.98
−2.97							−2.97
−2.96							−2.96
−2.95							−2.95
−2.94							−2.94
−2.93							−2.93
−2.92							−2.92
−2.91							−2.91
−2.90							−2.90
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−2.87	.000001						−2.87
−2.86	.000001						−2.86
−2.85	.000001						−2.85
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−2.83	.000001						−2.83
−2.82	.000002						−2.82
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−2.78	.000003						−2.78
−2.77	.000004						−2.77
−2.76	.000004						−2.76
−2.75	.000005						−2.75
−2.74	.000006						−2.74
−2.73	.000007						−2.73
−2.72	.000008						−2.72
−2.71	.000010						−2.71
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−2.69	.000013						−2.69
−2.68	.000015						−2.68
−2.67	.000017						−2.67
−2.66	.000020						−2.66
−2.65	.000023						−2.65
−2.64	.000026						−2.64
−2.63	.000029						−2.63
−2.62	.000033						−2.62
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−2.59	.000048	.000001					−2.59
−2.58	.000054	.000001					−2.58
−2.57	.000061	.000002					−2.57
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−2.55	.000076	.000003					−2.55
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−2.53	.000095	.000004					−2.53
−2.52	.000106	.000005					−2.52
−2.51	.000117	.000007					−2.51
−2.50	.000130	.000008					−2.50

t	SKEWNESS 0	.1	.2	.3	.4	.5	t
−2.49	.006387	.004873	.003477	.002253	.001258	.000546	−2.49
−2.48	.006569	.005030	.003606	.002351	.001326	.000585	−2.48
−2.47	.006756	.005191	.003739	.002454	.001397	.000626	−2.47
−2.46	.006947	.005356	.003876	.002560	.001471	.000670	−2.46
−2.45	.007143	.005527	.004017	.002671	.001549	.000716	−2.45
−2.44	.007344	.005701	.004163	.002785	.001631	.000765	−2.44
−2.43	.007549	.005881	.004314	.002904	.001716	.000817	−2.43
−2.42	.007760	.006066	.004469	.003027	.001805	.000872	−2.42
−2.41	.007976	.006256	.004629	.003154	.001898	.000930	−2.41
−2.40	.008198	.006450	.004794	.003286	.001994	.000992	−2.40
−2.39	.008424	.006651	.004964	.003423	.002095	.001056	−2.39
−2.38	.008656	.006856	.005140	.003565	.002201	.001124	−2.38
−2.37	.008894	.007067	.005320	.003711	.002310	.001196	−2.37
−2.36	.009137	.007284	.005507	.003863	.002425	.001272	−2.36
−2.35	.009387	.007506	.005698	.004020	.002544	.001352	−2.35
−2.34	.009642	.007735	.005896	.004183	.002668	.001435	−2.34
−2.33	.009903	.007969	.006099	.004351	.002797	.001524	−2.33
−2.32	.010170	.008209	.006308	.004525	.002932	.001616	−2.32
−2.31	.010444	.008456	.006523	.004704	.003072	.001714	−2.31
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−2.28	.011304	.009235	.007208	.005280	.003526	.002036	−2.28
−2.27	.011604	.009508	.007449	.005485	.003689	.002154	−2.27
−2.26	.011911	.009788	.007698	.005697	.003859	.002277	−2.26
−2.25	.012224	.010075	.007953	.005915	.004035	.002407	−2.25
−2.24	.012545	.010369	.008215	.006140	.004218	.002542	−2.24
−2.23	.012874	.010670	.008485	.006373	.004407	.002684	−2.23
−2.22	.013209	.010979	.008762	.006613	.004604	.002832	−2.22
−2.21	.013553	.011296	.009047	.006860	.004808	.002987	−2.21
−2.20	.013903	.011621	.009340	.007116	.005020	.003149	−2.20
−2.19	.014262	.011953	.009641	.007379	.005239	.003318	−2.19
−2.18	.014629	.012293	.009950	.007650	.005466	.003494	−2.18
−2.17	.015003	.012642	.010267	.007930	.005702	.003679	−2.17
−2.16	.015386	.012999	.010593	.008218	.005945	.003871	−2.16
−2.15	.015778	.013365	.010927	.008515	006197	.004071	−2.15
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−2.11	.017429	.014916	.012355	.009793	.007296	.004958	−2.11
−2.10	.017864	.015327	.012736	.010136	.007594	.005202	−2.10
−2.09	.018309	.015747	.013126	.010490	.007903	.005457	−2.09
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−2.05	.020182	.017527	.014788	.012006	.009240	.006577	−2.05
−2.04	.020675	.017997	.015230	.012412	.009602	.006885	−2.04
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−2.02	.021692	.018970	.016147	.013258	.010359	.007534	−2.02
−2.01	.022216	.019472	.016622	.013698	.010756	.007876	−2.01
−2.00	.022750	.019986	.017108	.014150	.011165	.008231	−2.00

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
-2.49	.000144	.000010					-2.49
-2.48	.000160	.000012					-2.48
-2.47	.000176	.000015					-2.47
-2.46	.000195	.000018					-2.46
-2.45	.000214	.000021					-2.45
-2.44	.000236	.000025					-2.44
-2.43	.000259	.000030					-2.43
-2.42	.000284	.000036					-2.42
-2.41	.000311	.000042					-2.41
-2.40	.000340	.000049					-2.40
-2.39	.000372	.000057					-2.39
-2.38	.000406	.000066					-2.38
-2.37	.000442	.000076	.000001				-2.37
-2.36	.000481	.000087	.000001				-2.36
-2.35	.000523	.000100	.000001				-2.35
-2.34	.000569	.000115	.000002				-2.34
-2.33	.000617	.000131	.000003				-2.33
-2.32	.000668	.000149	.000004				-2.32
-2.31	.000724	.000169	.000005				-2.31
-2.30	.000783	.000191	.000007				-2.30
-2.29	.000845	.000215	.000010				-2.29
-2.28	.000912	.000242	.000013				-2.28
-2.27	.000984	.000271	.000017				-2.27
-2.26	.001060	.000304	.000021				-2.26
-2.25	.001140	.000339	.000027				-2.25
-2.24	.001226	.000378	.000034				-2.24
-2.23	.001317	.000421	.000042				-2.23
-2.22	.001413	.000467	.000051				-2.22
-2.21	.001515	.000517	.000062				-2.21
-2.20	.001623	.000571	.000075				-2.20
-2.19	.001737	.000631	.000091				-2.19
-2.18	.001857	.000695	.000108				-2.18
-2.17	.001985	.000764	.000128				-2.17
-2.16	.002119	.000838	.000151				-2.16
-2.15	.002261	.000918	.000178	.000001			-2.15
-2.14	.002410	.001005	.000207	.000002			-2.14
-2.13	.002567	.001097	.000241	.000003			-2.13
-2.12	.002732	.001197	.000279	.000005			-2.12
-2.11	.002906	.001303	.000321	.000008			-2.11
-2.10	.003088	.001417	.000368	.000012			-2.10
-2.09	.003280	.001539	.000421	.000017			-2.09
-2.08	.003481	.001669	.000479	.000024			-2.08
-2.07	.003692	.001807	.000543	.000033			-2.07
-2.06	.003912	.001954	.000614	.000045			-2.06
-2.05	.004144	.002111	.000692	.000059			-2.05
-2.04	.004386	.002277	.000777	.000076			-2.04
-2.03	.004639	.002453	.000870	.000097			-2.03
-2.02	.004903	.002640	.000972	.000123			-2.02
-2.01	.005179	.002838	.001083	.000153			-2.01
-2.00	.005468	.003047	.001203	.000189			-2.00

t	SKEWNESS 0	.1	.2	.3	.4	.5	t
−1.99	.023295	.020511	.017607	.014615	.011586	.008598	−1.99
−1.98	.023852	.021047	.018117	.015091	.012020	.008979	−1.98
−1.97	.024419	.021595	.018639	.015581	.012467	.009372	−1.97
−1.96	.024998	.022155	.019174	.016083	.012927	.009780	−1.96
−1.95	.025588	.022727	.019721	.016598	.013401	.010201	−1.95
−1.94	.026190	.023310	.020281	.017126	.013888	.010636	−1.94
−1.93	.026803	.023907	.020854	.017668	.014390	.011086	−1.93
−1.92	.027429	.024515	.021439	.018223	.014906	.011550	−1.92
−1.91	.028067	.025137	.022039	.018793	.015436	.012030	−1.91
−1.90	.028717	.025771	.022652	.019377	.015982	.012525	−1.90
−1.89	.029379	.026419	.023278	.019975	.016542	.013036	−1.89
−1.88	.030054	.027080	.023919	.020588	.017118	.013564	−1.88
−1.87	.030742	.027754	.024573	.021216	.017710	.014107	−1.87
−1.86	.031443	.028442	.025243	.021859	.018318	.014668	−1.86
−1.85	.032157	.029144	.025926	.022517	.018942	.015245	−1.85
−1.84	.032884	.029859	.026625	.023192	.019582	.015840	−1.84
−1.83	.033625	.030590	.027339	.023882	.020240	.016453	−1.83
−1.82	.034379	.031344	.028068	.024588	.020914	.017084	−1.82
−1.81	.035148	.032093	.028812	.025311	.021606	.017734	−1.81
−1.80	.035930	.032867	.029572	.026050	.022315	.018402	−1.80
−1.79	.036727	.033656	.030349	.026806	.023043	.019089	−1.79
−1.78	.037538	.034461	.031141	.027580	.023789	.019796	−1.78
−1.77	.038364	.035280	.031949	.028371	.024553	.020522	−1.77
−1.76	.039204	.036116	.032775	.029179	.025336	.021269	−1.76
−1.75	.040059	.036967	.033617	.030005	.026138	.022036	−1.75
−1.74	.040930	.037834	.034476	.030850	.026960	.022823	−1.74
−1.73	.041815	.038717	.035352	.031713	.027801	.023632	−1.73
−1.72	.042716	.039617	.036245	.032594	.028662	.024462	−1.72
−1.71	.043633	.040533	.037157	.033494	.029543	.025314	−1.71
−1.70	.044565	.041466	.038086	.034414	.030445	.026188	−1.70
−1.69	.045514	.042416	.039033	.035352	.031368	.027084	−1.69
−1.68	.046479	.043384	.039999	.036310	.032311	.028002	−1.68
−1.67	.047460	.044368	.040983	.037288	.033276	.028944	−1.67
−1.66	.048457	.045371	.041985	.038287	.034262	.029909	−1.66
−1.65	.049471	.046390	.043007	.039305	.035270	.030897	−1.65
−1.64	.050503	.047428	.044048	.040344	.036300	.031909	−1.64
−1.63	.051551	.048484	.045108	.041403	.037353	.032946	−1.63
−1.62	.052616	.049559	.046188	.042484	.038428	.034006	−1.62
−1.61	.053699	.050652	.047288	.043586	.039525	.035092	−1.61
−1.60	.054799	.051763	.048407	.044709	.040646	.036202	−1.60
−1.59	.055917	.052893	.049547	.045853	.041791	.037338	−1.59
−1.58	.057053	.054043	.050707	.047020	.042958	.038499	−1.58
−1.57	.058208	.055212	.051887	.048209	.044150	.039687	−1.57
−1.56	.059380	.056400	.053089	.049420	.045365	.040900	−1.56
−1.55	.060571	.057608	.054311	.050653	.046605	.042139	−1.55
−1.54	.061780	.058835	.055555	.051909	.047870	.043405	−1.54
−1.53	.063008	.060083	.056820	.053189	.049159	.044698	−1.53
−1.52	.064255	.061351	.058106	.054491	.050473	.046018	−1.52
−1.51	.065522	.062639	.059414	.055816	.051812	.047366	−1.51
−1.50	.066807	.063947	.060744	.057165	.053176	.048740	−1.50

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
-1.99	.005769	.003269	.001333	.000230			-1.99
-1.98	.006083	.003502	.001474	.000279			-1.98
-1.97	.006410	.003748	.001625	.000334	.000001		-1.97
-1.96	.006751	.004007	.001789	.000397	.000002		-1.96
-1.95	.007105	.004280	.001965	.000469	.000004		-1.95
-1.94	.007475	.004567	.002153	.000551	.000008		-1.94
-1.93	.007859	.004869	.002355	.000642	.000014		-1.93
-1.92	.008258	.005185	.002571	.000745	.000024		-1.92
-1.91	.008672	.005518	.002801	.000859	.000038		-1.91
-1.90	.009103	.005866	.003047	.000986	.000057		-1.90
-1.89	.009550	.006230	.003309	.001126	.000082		-1.89
-1.88	.010013	.006612	.003587	.001280	.000114		-1.88
-1.87	.010494	.007011	.003882	.001449	.000155		-1.87
-1.86	.010992	.007428	.004195	.001634	.000205		-1.86
-1.85	.011509	.007864	.004526	.001836	.000266		-1.85
-1.84	.012043	.008318	.004876	.002055	.000339		-1.84
-1.83	.012596	.008792	.005246	.002293	.000425		-1.83
-1.82	.013168	.009286	.005637	.002550	.000526		-1.82
-1.81	.013760	.009800	.006048	.002827	.000642		-1.81
-1.80	.014372	.010334	.006480	.003126	.000776	.000001	-1.80
-1.79	.015003	.010891	.006935	.003446	.000929	.000006	-1.79
-1.78	.015656	.011469	.007413	.003789	.001101	.000016	-1.78
-1.77	.016329	.012070	.007914	.004156	.001295	.000033	-1.77
-1.76	.017024	.012693	.008439	.004548	.001511	.000062	-1.76
-1.75	.017741	.013340	.008989	.004965	.001752	.000103	-1.75
-1.74	.018480	.014011	.009564	.005408	.002017	.000159	-1.74
-1.73	.019242	.014706	.010165	.005879	.002309	.000233	-1.73
-1.72	.020026	.015425	.010793	.006377	.002629	.000328	-1.72
-1.71	.020834	.016170	.011448	.006904	.002979	.000446	-1.71
-1.70	.021666	.016941	.012130	.007461	.003358	.000590	-1.70
-1.69	.022522	.017737	.012841	.008048	.003769	.000761	-1.69
-1.68	.023402	.018560	.013580	.008667	.004213	.000962	-1.68
-1.67	.024307	.019410	.014349	.009317	.004691	.001195	-1.67
-1.66	.025238	.020288	.015148	.010001	.005204	.001462	-1.66
-1.65	.026194	.021193	.015978	.010717	.005753	.001766	-1.65
-1.64	.027175	.022127	.016838	.011468	.006339	.002109	-1.64
-1.63	.028183	.023090	.017731	.012254	.006965	.002491	-1.63
-1.62	.029218	.024081	.018655	.013075	.007629	.002916	-1.62
-1.61	.030280	.025102	.019612	.013933	.008334	.003385	-1.61
-1.60	.031368	.026153	.020602	.014827	.009080	.003899	-1.60
-1.59	.032485	.027235	.021625	.015759	.009868	.004460	-1.59
-1.58	.033629	.028346	.022683	.016729	.010699	.005069	-1.58
-1.57	.034801	.029489	.023775	.017738	.011574	.005729	-1.57
-1.56	.036002	.030664	.024902	.018786	.012494	.006439	-1.56
-1.55	.037232	.031870	.026064	.019873	.013459	.007202	-1.55
-1.54	.038490	.033108	.027262	.021001	.014470	.008018	-1.54
-1.53	.039778	.034378	.028496	.022170	.015528	.008889	-1.53
-1.52	.041096	.035681	.029766	.023380	.016633	.009816	-1.52
-1.51	.042444	.037018	.031074	.024632	.017786	.010799	-1.51
-1.50	.043821	.038387	.032418	.025926	.018988	.011839	-1.50

t	SKEWNESS						t
	0	.1	.2	.3	.4	.5	
−1.49	.068112	.065277	.062096	.058538	.054566	.050143	−1.49
−1.48	.069437	.066627	.063471	.059935	.055982	.051574	−1.48
−1.47	.070781	.067998	.064867	.061355	.057424	.053033	−1.47
−1.46	.072145	.069390	.066287	.062800	.058892	.054520	−1.46
−1.45	.073529	.070804	.067729	.064270	.060387	.056036	−1.45
−1.44	.074934	.072239	.069194	.065764	.061908	.057580	−1.44
−1.43	.076359	.073696	.070682	.067283	.063455	.059154	−1.43
−1.42	.077804	.075174	.072194	.068827	.065030	.060757	−1.42
−1.41	.079270	.076675	.073729	.070398	.066631	.062389	−1.41
−1.40	.080757	.078197	.075288	.071990	.068260	.064051	−1.40
−1.39	.082264	.079742	.076870	.073609	.069916	.065742	−1.39
−1.38	.083793	.081310	.078476	.075254	.071600	.067463	−1.38
−1.37	.085343	.082899	.080106	.076925	.073312	.069214	−1.37
−1.36	.086915	.084512	.081761	.078622	.075051	.070995	−1.36
−1.35	.088508	.086147	.083439	.080345	.076818	.072807	−1.35
−1.34	.090123	.087806	.085143	.082094	.078613	.074649	−1.34
−1.33	.091759	.089487	.086870	.083869	.080436	.076521	−1.33
−1.32	.093418	.091192	.088623	.085670	.082288	.078423	−1.32
−1.31	.095098	.092920	.090400	.087498	.084168	.080357	−1.31
−1.30	.096800	.094671	.092202	.089353	.086077	.082321	−1.30
−1.29	.098525	.096446	.094029	.091234	.088014	.084316	−1.29
−1.28	.100273	.098245	.095881	.093142	.089980	.086341	−1.28
−1.27	.102042	.100068	.097759	.095076	.091974	.088398	−1.27
−1.26	.103835	.101914	.099662	.097038	.093997	.090485	−1.26
−1.25	.105650	.103785	.101590	.099027	.096050	.092604	−1.25
−1.24	.107488	.105679	.103544	.101043	.098131	.094754	−1.24
−1.23	.109349	.107598	.105523	.103086	.100241	.096934	−1.23
−1.22	.111232	.109541	.107528	.105156	.102380	.099146	−1.22
−1.21	.113139	.111508	.109559	.107254	.104548	.101389	−1.21
−1.20	.115070	.113500	.111616	.109379	.106746	.103663	−1.20
−1.19	.117023	.115516	.113698	.111531	.108972	.105968	−1.19
−1.18	.119000	.117557	.115806	.113711	.111228	.108304	−1.18
−1.17	.121000	.119622	.117941	.115918	.113512	.110671	−1.17
−1.16	.123024	.121713	.120101	.118153	.115826	.113069	−1.16
−1.15	.125072	.123828	.122288	.120415	.118169	.115498	−1.15
−1.14	.127143	.125968	.124500	.122705	.120541	.117958	−1.14
−1.13	.129238	.128132	.126739	.125022	.122942	.120448	−1.13
−1.12	.131357	.130322	.129004	.127367	.125172	.122970	−1.12
−1.11	.133500	.132537	.131294	.129739	.127831	.125522	−1.11
−1.10	.135666	.134776	.133612	.132139	.130319	.128104	−1.10
−1.09	.137857	.137041	.135955	.134566	.132836	.130717	−1.09
−1.08	.140071	.139330	.138324	.137021	.135381	.133361	−1.08
−1.07	.142310	.141645	.140720	.139503	.137955	.136034	−1.07
−1.06	.144572	.143985	.143142	.142012	.140558	.138738	−1.06
−1.05	.146859	.146350	.145590	.144549	.143190	.141472	−1.05
−1.04	.149170	.148740	.148064	.147112	.145850	.144235	−1.04
−1.03	.151505	.151155	.150564	.149703	.148538	.147029	−1.03
−1.02	.153864	.153595	.153090	.152322	.151255	.149851	−1.02
−1.01	.156248	.156060	.155643	.154967	.154000	.152703	−1.01
−1.00	.158655	.158551	.158221	.157639	.156773	.155584	−1.00

t	SKEWNESS .6	.7	.8	.9	1.0	1.1	t
-1.49	.045229	.039790	.033800	.027262	.020239	.012937	-1.49
-1.48	.046668	.041227	.035220	.028641	.021539	.014094	-1.48
-1.47	.048138	.042698	.036678	.030063	.022890	.015311	-1.47
-1.46	.049638	.044203	.038174	.031529	.024290	.016587	-1.46
-1.45	.051170	.045743	.039709	.033039	.025742	.017923	-1.45
-1.44	.052734	.047317	.041282	.034592	.027244	.019321	-1.44
-1.43	.054329	.048927	.042895	.036190	.028798	.020779	-1.43
-1.42	.055956	.050571	.044547	.037833	.030403	.022299	-1.42
-1.41	.057615	.052252	.046239	.039520	.032060	.023880	-1.41
-1.40	.059306	.053967	.047970	.041252	.033769	.025523	-1.40
-1.39	.061030	.055718	.049741	.043029	.035530	.027228	-1.39
-1.38	.062786	.057506	.051551	.044852	.037343	.028995	-1.38
-1.37	.064575	.059329	.053402	.046719	.039208	.030824	-1.37
-1.36	.066397	.061188	.055293	.048632	.041126	.032714	-1.36
-1.35	.068251	.063083	.057225	.050591	.043095	.034667	-1.35
-1.34	.070139	.065015	.059196	.052595	.045117	.036681	-1.34
-1.33	.072060	.066983	.061208	.054644	.047191	.038756	-1.33
-1.32	.074014	.068987	.063260	.056738	.049318	.040893	-1.32
-1.31	.076001	.071028	.065353	.058878	.051496	.043090	-1.31
-1.30	.078021	.073105	.067486	.061064	.053725	.045348	-1.30
-1.29	.080075	.075219	.069659	.063294	.056007	.047667	-1.29
-1.28	.082163	.077370	.071873	.065570	.058339	.050045	-1.28
-1.27	.084284	.079557	.074127	.067891	.060723	.052482	-1.27
-1.26	.086438	.081780	.076422	.070256	.063157	.054978	-1.26
-1.25	.088626	.084040	.078756	.072666	.065642	.057533	-1.25
-1.24	.090847	.086336	.081130	.075121	.068178	.060146	-1.24
-1.23	.093102	.088669	.083545	.077620	.070763	.062816	-1.23
-1.22	.095391	.091038	.085999	.080163	.073397	.065543	-1.22
-1.21	.097712	.093444	.088493	.082749	.076081	.068325	-1.21
-1.20	.100068	.093885	.091026	.085380	.078813	.071164	-1.20
-1.19	.102456	.098363	.093598	.088053	.081594	.074057	-1.19
-1.18	.104878	.100876	.096210	.090770	.084422	.077004	-1.18
-1.17	.107333	.103426	.098860	.093529	.087298	.080004	-1.17
-1.16	.109821	.106011	.101549	.096330	.090221	.083057	-1.16
-1.15	.112342	.108631	.104277	.099173	.093189	.086162	-1.15
-1.14	.114897	.111287	.107042	.102058	.096204	.089318	-1.14
-1.13	.117484	.113978	.109846	.104984	.099264	.092525	-1.13
-1.12	.120103	.116704	.112687	.107951	.102368	.095781	-1.12
-1.11	.122756	.119464	.115565	.110958	.105517	.099086	-1.11
-1.10	.125440	.122259	.118480	.114005	.108708	.102438	-1.10
-1.09	.128157	.125089	.121433	.117091	.111943	.105838	-1.09
-1.08	.130906	.127952	.124421	.120216	.115220	.109283	-1.08
-1.07	.133687	.130849	.127445	.123380	.118539	.112774	-1.07
-1.06	.136499	.133780	.130505	.126582	.121898	.116310	-1.06
-1.05	.139344	.136744	.133600	.129822	.125298	.119888	-1.05
-1.04	.142219	.139741	.136731	.133099	.128737	.123510	-1.04
-1.03	.145125	.142771	.139895	.136412	.132215	.127173	-1.03
-1.02	.148063	.145833	.143094	.139761	.135732	.130877	-1.02
-1.01	.151031	.148927	.146326	.143146	.139286	.134621	-1.01
-1.00	.154029	.152053	.149592	.146565	.142877	.138404	-1.00

t	SKEWNESS						t
	0	.1	.2	.3	.4	.5	
− .99	.161087	.161066	.160825	.160338	.159573	.158494	− .99
− .98	.163543	.163606	.163455	.163064	.162402	.161433	− .98
− .97	.166023	.166172	.166111	.165816	.165258	.164401	− .97
− .96	.168528	.168762	.168792	.168595	.168141	.167396	− .96
− .95	.171056	.171377	.171500	.171400	.171052	.170420	− .95
− .94	.173609	.174017	.174232	.174232	.173989	.173472	− .94
− .93	.176186	.176682	.176990	.177090	.176954	.176551	− .93
− .92	.178786	.179371	.179774	.179974	.179945	.179658	− .92
− .91	.181411	.182085	.182583	.182883	.182963	.182792	− .91
− .90	.184060	.184823	.185416	.185819	.186007	.185953	− .90
− .89	.186733	.187587	.188275	.188780	.189077	.189140	− .89
− .88	.189430	.190374	.191159	.191766	.192173	.192354	− .88
− .87	.192150	.193186	.194068	.194778	.195295	.195594	− .87
− .86	.194895	.196022	.197001	.197814	.198442	.198860	− .86
− .85	.197663	.198882	.199959	.200876	.201614	.202151	− .85
− .84	.200454	.201766	.202941	.203962	.204812	.205467	− .84
− .83	.203269	.204674	.205947	.207073	.208034	.208808	− .83
− .82	.206108	.207606	.208977	.210208	.211280	.212174	− .82
− .81	.208970	.210561	.212031	.213366	.214551	.215564	− .81
− .80	.211855	.213540	.215109	.216549	.217845	.218978	− .80
− .79	.214764	.216542	.218210	.219756	.221163	.222415	− .79
− .78	.217695	.219568	.221335	.222985	.224504	.225876	− .78
− .77	.220650	.222616	.224483	.226238	.227869	.229359	− .77
− .76	.223627	.225687	.227653	.229514	.231256	.232865	− .76
− .75	.226627	.228782	.230847	.232812	.234666	.236393	− .75
− .74	.229650	.231898	.234063	.236133	.238097	.239943	− .74
− .73	.232695	.235038	.237301	.239476	.241551	.243514	− .73
− .72	.235762	.238199	.240561	.242840	.245026	.247106	− .72
− .71	.238852	.241382	.243843	.246227	.248522	.250719	− .71
− .70	.241964	.244588	.247147	.249634	.252039	.254353	− .70
− .69	.245097	.247815	.250472	.253063	.255577	.258006	− .69
− .68	.248252	.251063	.253819	.256512	.259135	.261678	− .68
− .67	.251429	.254333	.257186	.259982	.262712	.265370	− .67
− .66	.254627	.257624	.260574	.263471	.266310	.269080	− .66
− .65	.257846	.260935	.263982	.266981	.269926	.272809	− .65
− .64	.261086	.264267	.267410	.270510	.273561	.276555	− .64
− .63	.264347	.267620	.270858	.274058	.277214	.280319	− .63
− .62	.267629	.270993	.274326	.277625	.280885	.284100	− .62
− .61	.270931	.274385	.277813	.281211	.284574	.287897	− .61
− .60	.274253	.277797	.281319	.284815	.288281	.291711	− .60
− .59	.277595	.281229	.284844	.288437	.292004	.295540	− .59
− .58	.280957	.284680	.288387	.292076	.295743	.299385	− .58
− .57	.284339	.288149	.291948	.295732	.299499	.303244	− 57
− .56	.287740	.291638	.295527	.299406	.303270	.307118	− .56
− .55	.291160	.295144	.299123	.303095	.307057	.311006	− .55
− .54	.294599	.298669	.302737	.306801	.310859	.314908	− .54
− .53	.298056	.302211	.306368	.310523	.314675	.318822	− .53
− .52	.301532	.305771	.310015	.314260	.318506	.322749	− .52
− .51	.305026	.309349	.313678	.318012	.322350	.326689	− .51
− .50	.308538	.312943	.317357	.321779	.326207	.330640	− .50

t	SKEWNESS .6	.7	.8	.9	1.0	1.1	t
− .99	.157058	.155211	.152890	.150019	.146503	.142224	− .99
− .98	.160116	.158399	.156221	.153507	.150166	.146082	− .98
− .97	.163204	.161618	.159584	.157028	.153862	.149976	− .97
− .96	.166321	.164868	.162978	.160582	.157593	.153905	− .96
− .95	.169468	.168147	.166403	.164168	.161357	.157869	− .95
− .94	.172643	.171457	.169859	.167785	.165153	.161866	− .94
− .93	.175846	.174795	.173345	.171433	.168981	.165895	− .93
− .92	.179078	.178162	.176860	.175111	.172840	.169956	− .92
− .91	.182337	.181558	.180405	.178819	.176729	.174047	− .91
− .90	.185624	.184981	.183978	.182556	.180648	.178168	− .90
− .89	.188938	.188433	.187578	.186321	.184595	.182317	− .89
− .88	.192279	.191911	.191207	.190114	.188569	.186495	− .88
− .87	.195646	.195416	.194862	.193934	.192571	.190699	− .87
− .86	.199040	.198948	.198544	.197781	.196599	.194929	− .86
− .85	.202459	.202505	.202252	.201653	.200653	.199184	− .85
− .84	.205903	.206088	.205985	.205551	.204731	.203463	− .84
− .83	.209372	.209695	.209743	.209473	.208834	.207765	− .83
− .82	.212866	.213328	.213525	.213419	.212959	.212089	− .82
− .81	.216384	.216984	.217331	.217388	.217107	.216434	− .81
− .80	.219926	.220654	.221160	.221379	.221277	.220801	− .80
− .79	.223491	.224366	.225012	.225393	.225468	.225186	− .79
− .78	.227079	.228092	.228886	.229428	.229678	.229590	− .78
− .77	.230690	.231839	.232781	.233483	.233909	.234012	− .77
− .76	.234323	.235608	.236697	.237558	.238157	.238451	− .76
− .75	.237977	.239399	.240633	.241653	.242424	.242906	− .75
− .74	.241653	.243210	.244589	.245766	.246708	.247376	− .74
− .73	.245350	.247040	.248565	.249897	.251008	.251861	− .73
− .72	.249067	.250891	.252558	.254045	.255323	.256359	− .72
− .71	.252804	.254761	.256570	.258210	.259654	.260869	− .71
− .70	.256561	.258649	.260599	.262391	.263998	.265392	− .70
− .69	.260336	.262555	.264645	.266587	.268356	.269926	− .69
− .68	.264131	.266479	.268708	.270798	.272727	.274469	− .68
− .67	.267943	.270420	.272786	.275022	.277110	.279023	− .67
− .66	.271773	.274377	.276879	.279260	.281503	.283585	− .66
− .65	.275621	.278351	.280986	.283511	.285908	.288154	− .65
− .64	.279485	.282340	.285107	.287774	.290322	.292731	− .64
− .63	.283365	.286343	.289242	.292048	.294745	.297315	− .63
− .62	.287261	.290361	.293389	.296333	.299177	.301903	− .62
− .61	.291173	.294394	.297549	.300628	.303616	.306497	− .61
− .60	.295099	.298439	.301720	.304932	.308063	.311095	− .60
− .59	.299040	.302497	.305902	.309246	.312515	.315697	− .59
− .58	.302995	.306568	.310095	.313567	.316974	.320301	− .58
− .57	.306963	.310650	.314297	.317897	.321437	.324907	− .57
− .56	.310944	.314743	.318509	.322233	.325905	.329514	− .56
− .55	.314938	.318848	.322729	.326575	.330377	.334122	− .55
− .54	.318944	.322962	.326958	.330924	.334851	.338730	− .54
− .53	.322961	.327086	.331194	.335277	.339328	.343338	− .53
− .52	.326989	.331219	.335437	.339635	.343807	.347944	− .52
− .51	.331027	.335361	.339686	.343997	.348287	.352548	− .51
− .50	.335076	.339511	.343942	.348363	.352768	.357150	− .50

t	SKEWNESS						t
	0	.1	.2	.3	.4	.5	
− .49	.312067	.316554	.321051	.325560	.330077	.334603	− .49
− .48	.315614	.320181	.324761	.329354	.333960	.338576	− .48
− .47	.319178	.323824	.328486	.333163	.337854	.342560	− .47
− .46	.322758	.327483	.332225	.336984	.341761	.346553	− .46
− .45	.326355	.331157	.335978	.340819	.345678	.350557	− .45
− .44	.329969	.334846	.339745	.344665	.349607	.354569	− .44
− .43	.333598	.338550	.343525	.348524	.353545	.358590	− .43
− .42	.337243	.342269	.347319	.352394	.357494	.362619	− .42
− .41	.340903	.346001	.351125	.356275	.361452	.366655	− .41
− .40	.344578	.349747	.354944	.360167	.365419	.370699	− .40
− .39	.348268	.353507	.358774	.364070	.369395	.374749	− .39
− .38	.351973	.357280	.362616	.367982	.373379	.378806	− .38
− .37	.355691	.361065	.366469	.371904	.377371	.382869	− .37
− .36	.359424	.364863	.370333	.375835	.381370	.386937	− .36
− .35	.363169	.368673	.374208	.379775	.385376	.391010	− .35
− .34	.366928	.372494	.378092	.383723	.389388	.395087	− .34
− .33	.370700	.376327	.381986	.387680	.393407	.399169	− .33
− .32	.374484	.380171	.385890	.391643	.397431	.403254	− .32
− .31	.378280	.384025	.389802	.395614	.401460	.407342	− .31
− .30	.382089	.387889	.393723	.399591	.405494	.411432	− .30
− .29	.385908	.391763	.397652	.403575	.409532	.415525	− .29
− .28	.389739	.395647	.401589	.407564	.413575	.419620	− .28
− .27	.393580	.399540	.405533	.411559	.417620	.423716	− .27
− .26	.397432	.403441	.409483	.415559	.421669	.427813	− .26
− .25	.401294	.407351	.413441	.419563	.425720	.431910	− .25
− .24	.405165	.411269	.417404	.423572	.429773	.436008	− .24
− .23	.409046	.415194	.421373	.427584	.433828	.440105	− .23
− .22	.412936	.419126	.425348	.431600	.437884	.444201	− .22
− .21	.416834	.423066	.429327	.435619	.441941	.448296	− .21
− .20	.420740	.427011	.433311	.439640	.445999	.452389	− .20
− .19	.424655	.430963	.437298	.443663	.450056	.456479	− .19
− .18	.428576	.434920	.441290	.447688	.454113	.460568	− .18
− .17	.432505	.438882	.445284	.451714	.458170	.464653	− .17
− .16	.436441	.442849	.449282	.455740	.462225	.468735	− .16
− .15	.440382	.446820	.453282	.459768	.466278	.472813	− .15
− .14	.444330	.450796	.457284	.463795	.470329	.476887	− .14
− .13	.448283	.454775	.461288	.467822	.474378	.480956	− .13
− .12	.452242	.458757	.465293	.471848	.478424	.485020	− .12
− .11	.456205	.462742	.469298	.475873	.482466	.489079	− .11
− .10	.460172	.466730	.473304	.479896	.486505	.493132	− .10
− .09	.464144	.470719	.477310	.483917	.490540	.497178	− .09
− .08	.468119	.474711	.481316	.487936	.494570	.501218	− .08
− .07	.472097	.478703	.485321	.491952	.498595	.505251	− .07
− .06	.476078	.482696	.489325	.495964	.502615	.509277	− .06
− .05	.480061	.486690	.493327	.499973	.506629	.513295	− .05
− .04	.484047	.490683	.497327	.503978	.510637	.517310	− .04
− .03	.488034	.494676	.501324	.507978	.514639	.521306	− .03
− .02	.492022	.498668	.505319	.511974	.518634	.525298	− .02
− .01	.496011	.502660	.509311	.515965	.522621	.529282	− .01
.00	.500000	.506649	.513299	.519949	.526602	.533255	.00

t	SKEWNESS .6	.7	.8	.9	1.0	1.1	t
− .49	.339134	.343668	.348202	.352731	.357249	.361748	− .49
− .48	.343201	.347833	.352468	.357102	.361729	.366343	− .48
− .47	.347277	.352004	.356737	.361474	.366208	.370934	− .47
− .46	.351361	.356181	.361011	.365847	.370685	.375519	− .46
− .45	.355452	.360363	.365287	.370221	.375160	.380099	− .45
− .44	.359551	.364551	.369566	.374595	.379632	.384673	− .44
− .43	.363656	.368742	.373847	.378968	.384101	.389240	− .43
− .42	.367767	.372938	.378130	.383340	.388565	.393800	− .42
− .41	.371884	.377137	.382414	.387711	.393025	.398353	− .41
− .40	.376006	.381340	.386698	.392079	.397480	.402897	− .40
− .39	.380133	.385544	.390982	.396445	.401930	.407432	− .39
− .38	.384264	.389751	.395266	.400808	.406373	.411958	− .38
− .37	.388398	.393959	.399549	.405167	.410810	.416475	− .37
− .36	.392536	.398168	.403830	.409522	.415240	.420981	− .36
− .35	.396677	.402377	.408109	.413872	.419662	.425476	− .35
− .34	.400820	.406587	.412386	.418217	.424076	.429961	− .34
− .33	.404965	.410796	.416660	.422556	.428482	.434434	− .33
− .32	.409111	.415004	.420930	.426889	.432878	.438895	− .32
− .31	.413259	.419211	.425197	.431216	.437266	.443343	− .31
− .30	.417406	.423415	.429459	.435535	.441643	.447779	− .30
− .29	.421554	.427618	.433716	.439848	.446010	.452201	− .29
− .28	.425701	.431817	.437968	.444152	.450366	.456610	− .28
− .27	.429847	.436014	.442214	.448448	.454712	.461004	− .27
− .26	.433992	.440206	.446454	.452735	.459046	.465384	− .26
− .25	.438136	.444395	.450687	.457012	.463367	.469750	− .25
− .24	.442276	.448579	.454914	.461281	.467677	.474100	− .24
− .23	.446415	.452758	.459133	.465539	.471974	.478435	− .23
− .22	.450550	.456931	.463344	.469786	.476257	.482754	− .22
− .21	.454681	.461099	.467546	.474023	.480527	.487056	− .21
− .20	.458809	.465260	.471740	.478249	.484784	.491343	− .20
− .19	.462932	.469414	.475925	.482463	.489026	.495612	− .19
− .18	.467051	.473562	.480100	.486665	.493254	.499864	− .18
− .17	.471164	.477702	.484266	.490855	.497467	.504099	− .17
− .16	.475271	.481834	.488421	.495032	.501665	.508316	− .16
− .15	.479373	.485957	.492566	.499196	.505847	.512515	− .15
− .14	.483468	.490072	.496699	.503347	.510013	.516696	− .14
− .13	.487556	.494178	.500821	.507484	.514164	.520858	− .13
− .12	.491637	.498275	.504932	.511607	.518298	.525002	− .12
− .11	.495711	.502362	.509030	.515715	.522415	.529126	− .11
− .10	.499776	.506438	.513116	.519809	.526515	.533232	− .10
− .09	.503833	.510504	.517189	.523888	.530598	.537317	− .09
− .08	.507882	.514559	.521249	.527952	.534664	.541383	− .08
− .07	.511921	.518603	.525296	.532000	.538712	.545429	− .07
− .06	.515951	.522635	.529329	.536032	.542742	.549455	− .06
− .05	.519970	.526655	.533348	.540048	.546753	.553461	− .05
− .04	.523980	.530663	.537353	.544048	.550746	.557446	− .04
− .03	.527979	.534659	.541343	.548031	.554721	.561410	− .03
− .02	.531968	.538641	.545318	.551997	.558676	.565354	− .02
− .01	.535945	.542610	.549278	.555946	.562613	.569276	− .01
.00	.539910	.546566	.553222	.559878	.566530	.573177	.00

t	SKEWNESS						t
	0	.1	.2	.3	.4	.5	
.00	.500000	.506649	.513299	.519949	.526602	.533255	.00
.01	.503989	.510637	.517283	.523928	.530574	.537219	.01
.02	.507978	.514622	.521263	.527901	.534537	.541172	.02
.03	.511966	.518604	.525237	.531867	.538493	.545115	.03
.04	.515953	.522583	.529207	.535825	.542439	.549047	.04
.05	.519939	.526559	.533171	.539777	.546375	.552967	.05
.06	.523922	.530531	.537130	.543720	.550302	.556876	.06
.07	.527903	.534498	.541082	.547655	.554219	.560774	.07
.08	.531881	.538460	.545027	.551582	.558126	.564658	.08
.09	.535856	.542418	.548965	.555500	.562021	.568531	.09
.10	.539828	.546370	.552896	.559408	.565906	.572390	.10
.11	.543795	.550316	.556819	.563307	.569779	.576236	.11
.12	.547758	.554255	.560734	.567196	.573641	.580069	.12
.13	.551717	.558189	.564641	.571075	.577490	.583888	.13
.14	.555670	.562115	.568539	.574943	.581327	.587693	.14
.15	.559618	.566033	.572427	.578800	.585152	.591484	.15
.16	.563559	.569944	.576306	.582645	.588963	.595260	.16
.17	.567495	.573847	.580175	.586479	.592761	.599022	.17
.18	.571424	.577741	.584033	.590301	.596546	.602768	.18
.19	.575345	.581626	.587881	.594111	.600317	.606499	.19
.20	.579260	.585503	.591719	.597909	.604073	.610214	.20
.21	.583166	.589369	.595545	.601693	.607816	.613913	.21
.22	.587064	.593226	.599359	.605464	.611543	.617596	.22
.23	.590954	.597072	.603161	.609222	.615256	.621263	.23
.24	.594835	.600908	.606951	.612966	.618953	.624913	.24
.25	.598706	.604733	.610729	.616696	.622635	.628546	.25
.26	.602568	.608546	.614493	.620411	.626301	.632163	.26
.27	.606420	.612348	.618245	.624112	.629951	.635762	.27
.28	.610261	.616138	.621983	.627798	.633585	.639343	.28
.29	.614092	.619915	.625707	.631469	.637202	.642907	.29
.30	.617911	.623680	.629417	.635125	.640803	.646453	.30
.31	.621720	.627432	.633113	.638764	.644386	.649981	.31
.32	.625516	.631170	.636794	.642388	.647953	.653490	.32
.33	.629300	.634895	.640460	.645995	.651502	.656981	.33
.34	.633072	.638606	.644111	.649586	.655034	.660454	.34
.35	.636831	.642303	.647746	.653161	.658547	.663907	.35
.36	.640576	.645986	.651366	.656718	.662043	.667342	.36
.37	.644309	.649653	.654970	.660258	.665521	.670757	.37
.38	.648027	.653306	.658557	.663781	.668980	.674153	.38
.39	.651732	.656943	.662128	.667286	.672420	.677530	.39
.40	.655422	.660564	.665682	.670774	.675842	.680887	.40
.41	.659097	.664170	.669218	.674243	.679245	.684224	.41
.42	.662757	.667759	.672738	.677694	.682628	.687541	.42
.43	.666402	.671332	.676240	.681127	.685993	.690838	.43
.44	.670031	.674888	.679724	.684541	.689338	.694115	.44
.45	.673645	.678427	.683191	.687936	.692663	.697372	.45
.46	.677242	.681949	.686639	.691312	.695968	.700608	.46
.47	.680822	.685453	.690069	.694669	.699254	.703824	.47
.48	.684386	.688940	.693480	.698006	.702519	.707019	.48
.49	.687933	.692408	.696872	.701324	.705765	.710194	.49

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
.00	.539910	.546566	.553222	.559878	.566530	.573177	.00
.01	.543864	.550508	.557151	.563791	.570427	.577057	.01
.02	.547805	.554436	.561064	.567687	.574305	.580915	.02
.03	.551734	.558349	.564960	.571565	.578163	.584751	.03
.04	.555650	.562248	.568840	.575425	.582001	.588566	.04
.05	.559553	.566132	.572703	.579266	.585818	.592359	.05
.06	.563443	.570001	.576549	.583088	.589616	.596129	.06
.07	.567318	.573854	.580378	.586892	.593392	.599878	.07
.08	.571180	.577691	.584190	.590676	.597148	.603604	.08
.09	.575028	.581512	.587983	.594441	.600883	.607307	.09
.10	.578861	.585317	.591759	.598186	.604597	.610988	.10
.11	.582679	.589106	.595517	.601912	.608289	.614647	.11
.12	.586481	.592877	.599257	.605618	.611961	.618283	.12
.13	.590269	.596632	.602977	.609304	.615611	.621896	.13
.14	.594041	.600370	.606680	.612970	.619239	.625486	.14
.15	.597797	.604090	.610363	.616615	.622846	.629053	.15
.16	.601537	.607792	.614027	.620241	.626431	.632598	.16
.17	.605260	.611477	.617672	.623845	.629994	.636119	.17
.18	.608967	.615144	.621298	.627429	.633536	.639617	.18
.19	.612657	.618792	.624904	.630992	.637055	.643092	.19
.20	.616330	.622422	.628490	.634534	.640552	.646544	.20
.21	.619986	.626034	.632057	.638055	.644027	.649972	.21
.22	.623624	.629626	.635603	.641555	.647480	.653377	.22
.23	.627244	.633200	.639130	.645033	.650910	.656759	.23
.24	.630847	.636754	.642636	.648491	.654318	.660118	.24
.25	.634431	.640289	.646121	.651926	.657704	.663453	.25
.26	.637997	.643805	.649586	.655341	.661067	.666765	.26
.27	.641545	.647301	.653031	.658733	.664408	.670053	.27
.28	.645074	.650778	.656455	.662104	.667726	.673318	.28
.29	.648584	.654234	.659857	.665453	.671021	.676560	.29
.30	.652075	.657671	.663239	.668780	.674294	.679778	.30
.31	.655547	.661087	.666600	.672086	.677544	.682973	.31
.32	.659000	.664483	.669939	.675369	.680771	.686145	.32
.33	.662433	.667859	.673258	.678630	.683976	.689293	.33
.34	.665847	.671214	.676555	.681870	.687157	.692417	.34
.35	.669241	.674548	.679830	.685087	.690316	.695519	.35
.36	.672615	.677862	.683085	.688282	.693453	.698597	.36
.37	.675969	.681155	.686317	.691454	.696566	.701652	.37
.38	.679302	.684427	.689528	.694605	.699657	.704683	.38
.39	.682616	.687678	.692717	.697733	.702725	.707692	.39
.40	.685909	.690908	.695885	.700839	.705770	.710677	.40
.41	.689181	.694117	.699031	.703923	.708793	.713639	.41
.42	.692433	.697304	.702155	.706984	.711792	.716577	.42
.43	.695664	.700470	.705257	.710023	.714769	.719493	.43
.44	.698875	.703615	.708337	.713040	.717723	.722386	.44
.45	.702064	.706739	.711396	.716035	.720655	.725256	.45
.46	.705232	.709840	.714432	.719007	.723564	.728103	.46
.47	.708380	.712921	.717446	.721957	.726450	.730927	.47
.48	.711506	.715979	.720439	.724884	.729314	.733728	.48
.49	.714611	.719016	.723409	.727789	.732155	.736506	.49

t	SKEWNESS						t
	0	.1	.2	.3	.4	.5	
.50	.691462	.695859	.700245	.704622	.708990	.713347	.50
.51	.694974	.699290	.703599	.707901	.712194	.716480	.51
.52	.698468	.702704	.706934	.711159	.715378	.719591	.52
.53	.701944	.706098	.710249	.714397	.718541	.722681	.53
.54	.705401	.709473	.713544	.717615	.721684	.725751	.54
.55	.708840	.712829	.716820	.720812	.724805	.728798	.55
.56	.712260	.716165	.720075	.723989	.727906	.731825	.56
.57	.715661	.719481	.723310	.727145	.730985	.734830	.57
.58	.719043	.722778	.726524	.730280	.734043	.737814	.58
.59	.722405	.726054	.729718	.733394	.737080	.740776	.59
.60	.725747	.729311	.732891	.736487	.740096	.743716	.60
.61	.729069	.732546	.736044	.739559	.743090	.746635	.61
.62	.732371	.735761	.739175	.742609	.746062	.749532	.62
.63	.735653	.738955	.742285	.745638	.749013	.752407	.63
.64	.738914	.742129	.745374	.748646	.751942	.755261	.64
.65	.742154	.745281	.748441	.751632	.754850	.758093	.65
.66	.745373	.748411	.751487	.754596	.757736	.760902	.66
.67	.748571	.751521	.754511	.757539	.760599	.763691	.67
.68	.751748	.754608	.757514	.760459	.763441	.766457	.68
.69	.754903	.757674	.760494	.763358	.766261	.769201	.69
.70	.758036	.760719	.763453	.766235	.769060	.771923	.70
.71	.761148	.763741	.766390	.769090	.771836	.774624	.71
.72	.764238	.766741	.769304	.771922	.774590	.777302	.72
.73	.767305	.769719	.772196	.774733	.777322	.779959	.73
.74	.770350	.772674	.775067	.777521	.780032	.782593	.74
.75	.773373	.775607	.777914	.780287	.782719	.785206	.75
.76	.776373	.778518	.780739	.783031	.785385	.787797	.76
.77	.779350	.781406	.783542	.785752	.788029	.790366	.77
.78	.782305	.784271	.786322	.788451	.790650	.792913	.78
.79	.785236	.787113	.789080	.791128	.793249	.795438	.79
.80	.788145	.789933	.791815	.793782	.795826	.797941	.80
.81	.791030	.792729	.794527	.796414	.798382	.800423	.81
.82	.793892	.795503	.797217	.799023	.800914	.802883	.82
.83	.796731	.798254	.799883	.801610	.803425	.805321	.83
.84	.799546	.800981	.802527	.804175	.805914	.807737	.84
.85	.802337	.803685	.805148	.806717	.808381	.810132	.85
.86	.805105	.806366	.807747	.809237	.810825	.812505	.86
.87	.807850	.809024	.810322	.811734	.813248	.814856	.87
.88	.810570	.811658	.812875	.814208	.815649	.817186	.88
.89	.813267	.814269	.815404	.816661	.818027	.819495	.89
.90	.815940	.816856	.817911	.819091	.820384	.821782	.90
.91	.818589	.819420	.820395	.821498	.822719	.824047	.91
.92	.821214	.821961	.822856	.823884	.825032	.826291	.92
.93	.823814	.824478	.825294	.826247	.827324	.828515	.93
.94	.826391	.826972	.827709	.828587	.829593	.830716	.94
.95	.828944	.829443	.830101	.830905	.831841	.832897	.95
.96	.831472	.831889	.832471	.833202	.834068	.835057	.96
.97	.833977	.834313	.834818	.835476	.836272	.837196	.97
.98	.836457	.836713	.837142	.837727	.838456	.839314	.98
.99	.838913	.839089	.839443	.839957	.840618	.841411	.99

t	SKEWNESS .6	.7	.8	.9	1.0	1.1	t
.50	.717694	.722031	.726358	.730672	.734974	.739262	.50
.51	.720757	.725025	.729284	.733533	.737770	.741995	.51
.52	.723797	.727997	.732188	.736371	.740544	.744706	.52
.53	.726817	.730947	.735070	.739187	.743296	.747394	.53
.54	.729815	.733875	.737931	.741981	.746025	.750060	.54
.55	.732791	.736781	.740769	.744753	.748732	.752704	.55
.56	.735745	.739666	.743585	.747503	.751416	.755325	.56
.57	.738678	.742528	.746379	.750230	.754079	.757924	.57
.58	.741589	.745369	.749152	.752936	.756720	.760501	.58
.59	.744479	.748188	.751902	.755619	.759338	.763056	.59
.60	.747346	.750985	.755130	.758281	.761935	.765590	.60
.61	.750192	.753760	.757337	.760920	.764509	.768101	.61
.62	.753016	.756513	.760021	.763538	.767062	.770591	.62
.63	.755818	.759245	.762684	.766134	.769593	.773059	.63
.64	.758599	.761954	.765325	.768708	.772103	.775505	.64
.65	.761357	.764642	.767944	.771261	.774590	.777930	.65
.66	.764094	.767308	.770541	.773792	.777057	.780334	.66
.67	.766809	.769952	.773117	.776301	.779502	.782717	.67
.68	.769502	.772574	.775671	.778789	.781925	.785078	.68
.69	.772173	.775175	.778203	.781255	.784328	.787418	.69
.70	.774822	.777754	.780714	.783700	.786709	.789738	.70
.71	.777450	.780311	.783203	.786124	.789069	.792036	.71
.72	.780056	.782847	.785671	.788526	.791408	.794314	.72
.73	.782640	.785361	.788118	.790908	.793727	.796571	.73
.74	.785202	.787853	.790543	.793268	.796024	.798808	.74
.75	.787743	.790324	.792947	.795607	.798301	.801024	.75
.76	.790262	.792774	.795330	.797926	.800557	.803220	.76
.77	.792759	.795202	.797692	.800223	.802793	.805396	.77
.78	.795234	.797609	.800033	.802500	.805008	.807551	.78
.79	.797688	.799995	.802352	.804757	.807203	.809687	.79
.80	.800121	.802359	.804651	.806992	.809378	.811803	.80
.81	.802532	.804703	.806929	.809208	.811532	.813899	.81
.82	.804922	.807025	.809187	.811403	.813667	.815975	.82
.83	.807290	.809326	.811424	.813577	.815782	.818032	.83
.84	.809637	.811606	.813640	.815732	.817877	.820070	.84
.85	.811962	.813866	.815835	.817866	.819952	.822088	.85
.86	.814267	.816104	.818011	.819980	.822008	.824087	.86
.87	.816550	.818322	.820166	.822075	.824044	.826067	.87
.88	.818812	.820519	.822301	.824150	.826061	.828028	.88
.89	.821053	.822696	.824415	.826205	.828059	.829971	.89
.90	.823273	.824852	.826510	.828240	.830037	.831894	.90
.91	.825473	.826988	.828585	.830256	.831997	.833799	.91
.92	.827651	.829103	.830640	.832253	.833937	.835686	.92
.93	.829809	.831198	.832675	.834231	.835859	.837554	.93
.94	.831946	.833274	.834690	.836189	.837762	.839404	.94
.95	.834063	.835329	.836686	.838128	.839647	.841236	.95
.96	.836159	.837364	.838663	.840049	.841513	.843050	.96
.97	.838234	.839379	.840620	.841950	.843361	.844846	.97
.98	.840290	.841374	.842558	.843833	.845191	.846625	.98
.99	.842325	.843350	.844477	.845697	.847002	.848386	.99

t	SKEWNESS						t
	0	.1	.2	.3	.4	.5	
1.00	.841345	.841442	.841721	.842165	.842758	.843487	1.00
1.01	.843752	.843772	.843977	.844351	.844877	.845543	1.01
1.02	.846136	.846078	.846210	.846515	.846975	.847578	1.02
1.03	.848495	.848361	.848421	.848657	.849052	.849592	1.03
1.04	.850830	.850620	.850609	.850777	.851108	.851586	1.04
1.05	.853141	.852857	.852775	.852876	.853142	.853560	1.05
1.06	.855428	.855070	.854918	.854952	.855156	.855514	1.06
1.07	.857690	.857259	.857039	.857008	.857149	.857447	1.07
1.08	.859929	.859426	.859137	.859042	.859121	.859361	1.08
1.09	.862143	.861570	.861213	.861054	.861073	.861254	1.09
1.10	.864334	.863690	.863268	.863045	.863004	.863128	1.10
1.11	.866500	.865788	.865300	.865015	.864915	.864982	1.11
1.12	.868643	.867862	.867310	.866964	.866805	.866816	1.12
1.13	.870762	.869914	.869298	.868891	.868675	.868631	1.13
1.14	.872857	.871943	.871264	.870798	.870524	.870427	1.14
1.15	.874928	.873949	.873208	.872683	.872354	.872203	1.15
1.16	.876976	.875933	.875131	.874548	.874164	.873960	1.16
1.17	.879000	.877894	.877032	.876393	.875954	.875697	1.17
1.18	.881000	.879832	.878912	.878216	.877724	.877416	1.18
1.19	.882977	.881748	.880771	.880019	.879474	.879116	1.19
1.20	.884930	.883642	.882608	.881802	.881205	.880797	1.20
1.21	.886861	.885514	.884423	.883565	.882916	.882460	1.21
1.22	.888768	.887363	.886218	.885307	.884609	.884104	1.22
1.23	.890651	.889191	.887992	.887029	.886281	.885729	1.23
1.24	.892512	.890997	.889745	.888732	.887935	.887336	1.24
1.25	.894350	.892780	.891477	.890414	.889570	.888925	1.25
1.26	.896165	.894543	.893188	.892077	.891186	.890497	1.26
1.27	.897958	.896283	.894879	.893720	.892783	.892050	1.27
1.28	.899727	.898002	.896550	.895344	.894362	.893585	1.28
1.29	.901475	.899700	.898200	.896948	.895922	.895102	1.29
1.30	.903200	.901376	.899030	.898533	.897464	.896602	1.30
1.31	.904902	.903032	.901440	.900099	.898988	.898085	1.31
1.32	.906582	.904666	.903029	.901646	.900493	.899550	1.32
1.33	.908241	.906280	.904600	.903174	.901980	.900998	1.33
1.34	.909877	.907873	.906150	.904683	.903450	.902429	1.34
1.35	.911492	.909445	.907681	.906174	.904902	.903843	1.35
1.36	.913085	.910996	.909192	.907646	.906336	.905241	1.36
1.37	.914657	.912528	.910684	.909100	.907753	.906621	1.37
1.38	.916207	.914039	.912157	.910536	.909152	.907985	1.38
1.39	.917736	.915530	.913611	.911954	.910534	.909333	1.39
1.40	.919243	.917001	.915046	.913353	.911899	.910664	1.40
1.41	.920730	.918452	.916463	.914735	.913247	.911979	1.41
1.42	.922196	.919884	.917860	.916099	.914579	.913278	1.42
1.43	.923641	.921296	.919239	.917446	.915893	.914561	1.43
1.44	.925066	.922689	.920600	.918775	.917191	.915828	1.44
1.45	.926471	.924062	.921943	.920087	.918473	.917080	1.45
1.46	.927855	.925417	.923267	.921382	.919738	.918316	1.46
1.47	.929219	.926752	.924574	.922660	.920987	.919537	1.47
1.48	.930563	.928069	.925863	.923921	.922221	.920743	1.48
1.49	.931888	.929367	.927134	.925165	.923438	.921933	1.49

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
1.00	.844340	.845306	.846377	.847543	.848796	.850129	1.00
1.01	.846335	.847243	.848258	.849370	.850572	.851855	1.01
1.02	.848310	.849161	.850120	.851179	.852330	.853564	1.02
1.03	.850265	.851059	.851964	.852970	.854070	.855256	1.03
1.04	.852200	.852938	.853789	.854743	.855793	.856931	1.04
1.05	.854116	.854798	.855595	.856498	.857499	.858589	1.05
1.06	.856012	.856639	.857383	.858236	.859187	.860230	1.06
1.07	.857889	.858461	.859153	.859955	.860859	.861854	1.07
1.08	.859746	.860264	.860905	.861657	.862513	.863463	1.08
1.09	.861584	.862049	.862639	.863342	.864150	.865054	1.09
1.10	.863403	.863815	.864354	.865009	.865771	.866630	1.10
1.11	.865203	.865563	.866052	.866659	.867375	.868189	1.11
1.12	.866984	.867293	.867733	.868293	.868962	.869733	1.12
1.13	.868746	.869004	.869396	.869909	.870533	.871260	1.13
1.14	.870489	.870698	.871041	.871508	.872088	.872772	1.14
1.15	.872214	.872373	.872669	.873090	.873626	.874268	1.15
1.16	.873920	.874031	.874280	.874656	.875149	.875749	1.16
1.17	.875608	.875671	.875874	.876206	.876656	.877214	1.17
1.18	.877277	.877293	.877451	.877739	.878146	.878664	1.18
1.19	.878929	.878898	.879011	.879256	.879622	.880099	1.19
1.20	.880562	.880486	.880554	.880756	.881081	.881519	1.20
1.21	.882178	.882056	.882081	.882241	.882525	.882924	1.21
1.22	.883775	.883609	.883591	.883710	.883954	.884314	1.22
1.23	.885355	.885145	.885085	.885163	.885368	.885690	1.23
1.24	.886918	.886665	.886563	.886601	.886767	.887051	1.24
1.25	.888463	.888167	.888025	.888023	.888150	.888397	1.25
1.26	.889991	.889653	.889470	.889429	.889519	.889730	1.26
1.27	.891501	.891123	.890900	.890821	.890873	.891048	1.27
1.28	.892995	.892576	.892314	.892197	.892213	.892352	1.28
1.29	.894471	.894012	.893712	.893558	.893538	.893642	1.29
1.30	.895931	.895433	.895095	.894904	.894849	.894919	1.30
1.31	.897374	.896838	.896462	.896236	.896146	.896181	1.31
1.32	.898800	.898226	.897815	.897553	.897428	.897430	1.32
1.33	.900210	.899599	.899152	.898855	.898697	.898666	1.33
1.34	.901603	.900956	.900474	.900143	.899951	.899888	1.34
1.35	.902981	.902298	.901781	.901416	.901192	.901098	1.35
1.36	.904342	.903625	.903073	.902676	.902419	.902294	1.36
1.37	.905687	.904936	.904351	.903921	.903633	.903477	1.37
1.38	.907017	.906232	.905614	.905152	.904833	.904647	1.38
1.39	.908331	.907512	.906863	.906370	.906020	.905804	1.39
1.40	.909629	.908778	.908098	.907574	.907194	.906949	1.40
1.41	.910912	.910030	.909318	.908764	.908355	.908081	1.41
1.42	.912179	.911266	.910524	.909941	.909503	.909201	1.42
1.43	.913431	.912488	.911717	.911104	.910638	.910308	1.43
1.44	.914669	.913696	.912895	.912254	.911761	.911403	1.44
1.45	.915891	.914889	.914060	.913391	.912870	.912486	1.45
1.46	.917098	.916068	.915212	.914516	.913968	.913557	1.46
1.47	.918291	.917233	.916350	.915627	.915053	.914617	1.47
1.48	.919469	.918385	.917474	.916725	.916125	.915664	1.48
1.49	.920633	.919522	.918586	.917811	.917186	.916700	1.49

t	SKEWNESS						t
	0	.1	.2	.3	.4	.5	
1.50	.933193	.930647	.928388	.926393	.924639	.923108	1.50
1.51	.934478	.931908	.929625	.927604	.925825	.924269	1.51
1.52	.935745	.933151	.930844	.928799	.926996	.925415	1.52
1.53	.936992	.934376	.932046	.929978	.928151	.926546	1.53
1.54	.938220	.935584	.933232	.931141	.929291	.927663	1.54
1.55	.939429	.936773	.934400	.932288	.930416	.928765	1.55
1.56	.940620	.937945	.935552	.933419	.931526	.929853	1.56
1.57	.941792	.939100	.936688	.934535	.932621	.930927	1.57
1.58	.942947	.940238	.937808	.935635	.933701	.931987	1.58
1.59	.944083	.941358	.938911	.936720	.934767	.933034	1.59
1.60	.945201	.942462	.939998	.937790	.935819	.934066	1.60
1.61	.946301	.943548	.941070	.938845	.936856	.935086	1.61
1.62	.947384	.944619	.942126	.939885	.937879	.936091	1.62
1.63	.948449	.945673	.943166	.940910	.938888	.937084	1.63
1.64	.949497	.946710	.944191	.941921	.939884	.938063	1.64
1.65	.950529	.947732	.945201	.942918	.940866	.939029	1.65
1.66	.951543	.948737	.946195	.943900	.941834	.939982	1.66
1.67	.952540	.949727	.947175	.944868	.942789	.940923	1.67
1.68	.953521	.950701	.948140	.945822	.943730	.941851	1.68
1.69	.954486	.951660	.949191	.946762	.944658	.942766	1.69
1.70	.955435	.952604	.950027	.947688	.945574	.943669	1.70
1.71	.956367	.953532	.950948	.948601	.946476	.944559	1.71
1.72	.957284	.954446	.951856	.949500	.947366	.945438	1.72
1.73	.958185	.955345	.952750	.950387	.948243	.946304	1.73
1.74	.959070	.956229	.953629	.951260	.949107	.947159	1.74
1.75	.959941	.957098	.954495	.952120	.949959	.948002	1.75
1.76	.960796	.957954	.955348	.952967	.950799	.948833	1.76
1.77	.961636	.958795	.956187	.953802	.951627	.949652	1.77
1.78	.962462	.959623	.957013	.954624	.952443	.950461	1.78
1.79	.963273	.960436	.957826	.955433	.953247	.951258	1.79
1.80	.964070	.961236	.958626	.956230	.954040	.952044	1.80
1.81	.964852	.962023	.959413	.957015	.954820	.952818	1.81
1.82	.965621	.962796	.960188	.957788	.955590	.953582	1.82
1.83	.966375	.963556	.960950	.958550	.956348	.954335	1.83
1.84	.967116	.964303	.961699	.959299	.957095	.955078	1.84
1.85	.967843	.965037	.962437	.960037	.957831	.955810	1.85
1.86	.968557	.965759	.963162	.960763	.958555	.956531	1.86
1.87	.969258	.966468	.963876	.961479	.959270	.957242	1.87
1.88	.969946	.967165	.964578	.962182	.959973	.957943	1.88
1.89	.970621	.967849	.965268	.962875	.960666	.958634	1.89
1.90	.971283	.968522	.965947	.963557	.961348	.959315	1.90
1.91	.971933	.969183	.966615	.964228	.962020	.959986	1.91
1.92	.972571	.969832	.967271	.964889	.962682	.960647	1.92
1.93	.973197	.970469	.967916	.965539	.963334	.961299	1.93
1.94	.973810	.971095	.968551	.966178	.963976	.961941	1.94
1.95	.974412	.971710	.969174	.966808	.964608	.962573	1.95
1.96	.975002	.972313	.969787	.967427	.965231	.963197	1.96
1.97	.975581	.972906	.970390	.968036	.965844	.963811	1.97
1.98	.976148	.973488	.970982	.968635	.966447	.964416	1.98
1.99	.976705	.974059	.971564	.969224	.967041	.965013	1.99

t	SKEWNESS .6	.7	.8	.9	1.0	1.1	t
1.50	.921782	.920646	.919684	.918884	.918235	.917724	1.50
1.51	.922918	.921756	.920769	.919945	.919271	.918737	1.51
1.52	.924039	.922853	.921842	.920994	.920296	.919738	1.52
1.53	.925146	.923936	.922902	.922030	.921309	.920729	1.53
1.54	.926240	.925006	.923949	.923054	.922311	.921708	1.54
1.55	.927319	.926064	.924983	.924066	.923301	.922676	1.55
1.56	.928386	.927108	.926006	.925067	.924280	.923633	1.56
1.57	.929439	.928139	.927016	.926056	.925247	.924579	1.57
1.58	.930478	.929158	.928014	.927033	.926203	.925515	1.58
1.59	.931504	.930164	.929000	.927998	.927149	.926440	1.59
1.60	.932518	.931158	.929973	.928952	.928083	.927355	1.60
1.61	.933518	.932139	.930936	.929895	.929006	.928259	1.61
1.62	.934506	.933108	.931886	.930827	.929919	.929153	1.62
1.63	.935481	.934065	.932825	.931748	.930821	.930037	1.63
1.64	.936443	.935010	.933752	.932657	.931713	.930910	1.64
1.65	.937393	.935943	.934668	.933555	.932594	.931774	1.65
1.66	.938330	.936865	.935573	.934443	.933465	.932627	1.66
1.67	.939256	.937775	.936467	.935321	.934325	.933471	1.67
1.68	.940169	.938673	.937349	.936187	.935176	.934306	1.68
1.69	.941071	.939560	.938221	937043	.936016	.935130	1.69
1.70	.941960	.940435	.939082	.937889	.936847	.935945	1.70
1.71	.942838	.941300	.939932	.938725	.937668	.936751	1.71
1.72	.943704	.942153	.940772	.939551	.938479	.937547	1.72
1.73	.944559	.942995	.941601	.940366	.939280	.938334	1.73
1.74	.945403	.943827	.942420	.941172	.940072	.939112	1.74
1.75	.946235	.944647	.943228	.941967	.940855	.939881	1.75
1.76	.947056	.945457	.944027	.942753	.941628	.940641	1.76
1.77	.947866	.946257	.944815	.943530	.942392	.941392	1.77
1.78	.948665	.947046	.945593	.944296	.943146	.942134	1.78
1.79	.949454	.947825	.946362	.945054	.943892	.942868	1.79
1.80	.950232	.948594	.947121	.945802	.944629	.943593	1.80
1.81	.950999	.949353	.947870	.946541	.945357	.944309	1.81
1.82	.951756	.950101	.948609	.947270	.946076	.945017	1.82
1.83	.952502	.950840	.949339	.947991	.946786	.945717	1.83
1.84	.953239	.951569	.950060	.948702	.947488	.946408	1.84
1.85	.953965	.952289	.950772	.949405	.948181	.947092	1.85
1.86	.954681	.952999	.951474	.950099	.948866	.947767	1.86
1.87	.955388	.953699	.952167	.950785	.949543	.948434	1.87
1.88	.956085	.954390	.952852	.951461	.950211	.949093	1.88
1.89	.956772	.955072	.953527	.952130	.950871	.949745	1.89
1.90	.957449	.955745	.954191	.952790	.951523	.950389	1.90
1.91	.958117	.956409	.954852	.953441	.952168	.951025	1.91
1.92	.958776	.957064	.955502	.954085	.952804	.951653	1.92
1.93	.959426	.957710	.956143	.954720	.953432	.952274	1.93
1.94	.960066	.958347	.956776	.955347	.954053	.952888	1.94
1.95	.960698	.958975	.957400	.955966	.954666	.953494	1.95
1.96	.961320	.959595	.958017	.956578	.955272	.954093	1.96
1.97	.961934	.960207	.958645	.957181	.955870	.954684	1.97
1.98	.962539	.960810	.959225	.957777	.956460	.955269	1.98
1.99	.963135	.961405	.959817	.958365	.957044	.955847	1.99

t	SKEWNESS						t
	.0	.1	.2	.3	.4	.5	
2.00	.977250	.974620	.972136	.969804	.967626	.965600	2.00
2.01	.977784	.975170	.972698	.970375	.968202	.966179	2.01
2.02	.978308	.975711	.973251	.970936	.968768	.966749	2.02
2.03	.978822	.976241	.973793	.971487	.969326	.967310	2.03
2.04	.979325	.976761	.974326	.972030	.969875	.967863	2.04
2.05	.979818	.977271	.974850	.972563	.970415	.968408	2.05
2.06	.980301	.977772	.975365	.973088	.970947	.968944	2.06
2.07	.980774	.978264	.975870	.973604	.971471	.969473	2.07
2.08	.981237	.978745	.976366	.974111	.971986	.969993	2.08
2.09	.981691	.979218	.976854	.974609	.972492	.970505	2.09
2.10	.982136	.979682	.977332	.975100	.972991	.971010	2.10
2.11	.982571	.980137	.977802	.975581	.973482	.971507	2.11
2.12	.982997	.980583	.978264	.976055	.973964	.971996	2.12
2.13	.983414	.981020	.978717	.976521	.974439	.972478	2.13
2.14	.983823	.981449	.979162	.976978	.974907	.972952	2.14
2.15	.984222	.981869	.979591	.977428	.975366	.973419	2.15
2.16	.984614	.982281	.980028	.977870	.975818	.973879	2.16
2.17	.984997	.982685	.980449	.978304	.976263	.974332	2.17
2.18	.985371	.983081	.980862	.978731	.976701	.974777	2.18
2.19	.985738	.983469	.981267	.979151	.977131	.975216	2.19
2.20	.986097	.983849	.981665	.979563	.977554	.975648	2.20
2.21	.986447	.984222	.982056	.979967	.977970	.976073	2.21
2.22	.986791	.984587	.982439	.980365	.978380	.976491	2.22
2.23	.987126	.984945	.982815	.980756	.978782	.976903	2.23
2.24	.987455	.985296	.983184	.981140	.979178	.977308	2.24
2.25	.987776	.985639	.983546	.981517	.979567	.977707	2.25
2.26	.988089	.985975	.983901	.981887	.979950	.978099	2.26
2.27	.988396	.986305	.984249	.982251	.980326	.978486	2.27
2.28	.988696	.986627	.984590	.982608	.980696	.978866	2.28
2.29	.988989	.986943	.984925	.982959	.981060	.979240	2.29
2.30	.989276	.987253	.985254	.983303	.981417	.979608	2.30
2.31	.989556	.987556	.985576	.983641	.981768	.979970	2.31
2.32	.989830	.987852	.985892	.983973	.982114	.980326	2.32
2.33	.990097	.988143	.986202	.984299	.982453	.980677	2.33
2.34	.990358	.988427	.986506	.984620	.982787	.981022	2.34
2.35	.990613	.988705	.986804	.984934	.983115	.981361	2.35
2.36	.990863	.988977	.987096	.985242	.983438	.981695	2.36
2.37	.991106	.989244	.987382	.985545	.983754	.982023	2.37
2.38	.991344	.989505	.987662	.985843	.984066	.982346	2.38
2.39	.991576	.989760	.987937	.986134	.984372	.982664	2.39
2.40	.991802	.990010	.988207	.986421	.984672	.982976	2.40
2.41	.992024	.990254	.988471	.986702	.984968	.983283	2.41
2.42	.992240	.990493	.988730	.986978	.985258	.983586	2.42
2.43	.992451	.990727	.988984	.987249	.985543	.983883	2.43
2.44	.992656	.990955	.989232	.987514	.985823	.984175	2.44
2.45	.992857	.991179	.989476	.987775	.986098	.984463	2.45
2.46	.993053	.991398	.989714	.988031	.986369	.984746	2.46
2.47	.993244	.991612	.989948	.988281	.986634	.985024	2.47
2.48	.993431	.991821	.990177	.988528	.986895	.985297	2.48
2.49	.993613	.992025	.990401	.988769	.987152	.985566	2.49

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
2.00	.963723	.961992	.960402	.958946	.957620	.956417	2.00
2.01	.964303	.962571	.960978	.959519	.958189	.956981	2.01
2.02	.964874	.963142	.961547	960085	.958751	.957538	2.02
2.03	.965437	.963705	.962109	.960644	.959306	.958088	2.03
2.04	.965992	.964260	.962663	961196	.959854	.958632	2.04
2.05	.966539	.964808	.963209	.961740	.960395	.959169	2.05
2.06	.967079	.965348	.963749	.962277	.960929	.959699	2.06
2.07	.967610	.965880	.964281	.962808	.961457	.960223	2.07
2.08	.968133	.966405	.964806	.963331	.961978	.960740	2.08
2.09	.968649	.966923	.965324	,963848	.962492	.961252	2.09
2.10	.969158	.967433	.965834	,964358	.963000	.961757	2.10
2.11	.969659	.967937	.966338	.964861	.963502	.962256	2.11
2.12	.970153	.968433	.966836	.965358	.963997	.962748	2.12
2.13	.970639	.968922	.967326	.965848	.964486	.963235	2.13
2.14	.971118	.969404	.967810	.966332	.964969	.963716	2.14
2.15	.971590	.969880	.968287	.966810	.965446	.964191	2.15
2.16	.972056	.970349	.968758	.967281	.965916	.964660	2.16
2.17	.972514	.970811	.969222	.967746	.966381	.965123	2.17
2.18	.972965	.971266	.969680	.968205	.966840	.965580	2.18
2.19	.973410	.971715	.970132	.968658	.967293	.966032	2.19
2.20	.973848	.972158	.970577	.969105	.967740	.966479	2.20
2.21	.974280	.972594	.971017	.969546	.968181	.966919	2.21
2.22	.974705	.973024	.971450	.969981	.968617	.967355	2.22
2.23	.975124	.973448	.971877	.970411	.969047	.967785	2.23
2.24	.975536	.973866	.972299	.970834	.969472	.968209	2.24
2.25	.975943	.974278	.972714	.971252	.969891	.968628	2.25
2.26	.976343	.974684	.973124	.971665	.970305	.969043	2.26
2.27	.976737	.975084	.973528	.972072	.970713	.969451	2.27
2.28	.977125	.975478	.973927	.972473	.971116	.969855	2.28
2.29	.977507	.975866	.974320	.972869	.971515	.970254	2.29
2.30	.977883	.976249	.974708	.973260	.971907	.970648	2.30
2.31	.978254	.976626	.975090	.973646	.972295	.971037	2.31
2.32	.978619	.976998	.975466	.974026	.972678	.971421	2.32
2.33	.978978	.977364	.975838	.974402	.973056	.971800	2.33
2.34	.979332	.977725	.976204	.974772	.973429	.972175	2.34
2.35	.979681	.978081	.976565	.975137	.973797	.972544	2.35
2.36	.980024	.978431	.976921	.975497	.974160	.972909	2.36
2.37	.980361	.978776	.977273	.975853	.974519	.973270	2.37
2.38	.980694	.979116	.977619	.976203	.974872	.973626	2.38
2.39	.981021	.979451	.977960	.976549	.975222	.973977	3.39
2.40	.981343	.979782	.978296	.976891	.975566	.974324	2.40
2.41	.981660	.980107	.978628	.977227	.975907	.974667	2.41
2.42	.981973	.980427	.978955	.977559	.976242	.975005	2.42
2.43	.982280	.980743	.979277	.977886	.976574	.975339	2.43
2.44	.982583	.981054	.979594	.978209	.976900	.975669	2.44
2.45	.982880	.981360	.979908	.978528	.977223	.975995	2.45
2.46	.983174	.981662	.980216	.978842	.977541	.976316	2.46
2.47	.983462	.981959	.980520	.979152	.977856	.976634	2.47
2.48	.983746	.982251	.980820	.979457	.978166	.976947	2.48
2.49	.984026	.982540	.981116	.979759	.978472	.977257	2.49

t	SKEWNESS						t
	.0	.1	.2	.3	.4	.5	
2.50	.993790	.992225	.990621	.989006	.987403	.985830	2.50
2.51	.993963	.992421	.990836	.989238	.987650	.986090	2.51
2.52	.994132	.992612	.991047	.989466	.987893	.986346	2.52
2.53	.994297	.992799	.991253	.989690	.988132	.986597	2.53
2.54	.994457	.992981	.991455	.989909	.988366	.986844	2.54
2.55	.994614	.993159	.991653	.990124	.988596	.987087	2.55
2.56	.994766	.993334	.991847	.990335	.988822	.987326	2.56
2.57	.994915	.993504	.992036	.990542	.989043	.987560	2.57
2.58	.995060	.993671	.992222	.990744	.989261	.987791	2.58
2.59	.995201	.993833	.992404	.990943	.989475	.988018	2.59
2.60	.995339	.993992	.992582	.991138	.989685	.988240	2.60
2.61	.995473	.994147	.992756	.991329	.989891	.988459	2.61
2.62	.995604	.994299	.992926	.991516	.990093	.988675	2.62
2.63	.995731	.994447	.993093	.991700	.990291	.988886	2.63
2.64	.995855	.994591	.993256	.991880	.990486	.989094	2.64
2.65	.995975	.994732	.993416	.992057	.990677	.989299	2.65
2.66	.996093	.994870	.993571	.992230	.990865	.989499	2.66
2.67	.996207	.995005	.993725	.992399	.991050	.989697	2.67
2.68	.996319	.995135	.993875	.992565	.991230	.989891	2.68
2.69	.996427	.995264	.994021	.992728	.991408	.990081	2.69
2.70	.996533	.995389	.994165	.992888	.991582	.990268	2.70
2.71	.996636	.995512	.994305	.993044	.991753	.990452	2.71
2.72	.996736	.995631	.994442	.993197	.991921	.990633	2.72
2.73	.996833	.995747	.994576	.993347	.992086	.990811	2.73
2.74	.996928	.995861	.994707	.993494	.992247	.990985	2.74
2.75	.997020	.995972	.994835	.993638	.992406	.991156	2.75
2.76	.997110	.996080	.994960	.993780	.992561	.991325	2.76
2.77	.997197	.996185	.995083	.993918	.992714	.991490	2.77
2.78	.997282	.996288	.995203	.994053	.992863	.991653	2.78
2.79	.997365	.996388	.995320	.994186	.993010	.991812	2.79
2.80	.997445	.996486	.995435	.994316	.993154	.991969	2.80
2.81	.997523	.996582	.995547	.994443	.993295	.992123	2.81
2.82	.997599	.996675	.995656	.994568	.993434	.992274	2.82
2.83	.997673	.996766	.995763	.994690	.993570	.992422	2.83
2.84	.997744	.996854	.995868	.994810	.993703	.992568	2.84
2.85	.997814	.996941	.995970	.994927	.993834	.992712	2.85
2.86	.997882	.997025	.996070	.995041	.993962	.992852	2.86
2.87	.997948	.997107	.996167	.995154	.994088	.992990	2.87
2.88	.998012	.997187	.996263	.995264	.994212	.993126	2.88
2.89	.998074	.997265	.996356	.995371	.994333	.993259	2.89
2.90	.998134	.997341	.996447	.995477	.994451	.993390	2.90
2.91	.998193	.997415	.996536	.995580	.994568	.993519	2.91
2.92	.998250	.997487	.996623	.995681	.994682	.993645	2.92
2.93	.998305	.997557	.996708	.995780	.994794	.993768	2.93
2.94	.998359	.997626	.996791	.995876	.994903	.993890	2.94
2.95	.998411	.997693	.996872	.995971	.995011	.994009	2.95
2.96	.998462	.997758	.996951	.996064	.995116	.994127	2.96
2.97	.998511	.997821	.997028	.996154	.995219	.994242	2.97
2.98	.998559	.997883	.997104	.996243	.995321	.994355	2.98
2.99	.998605	.997943	.997178	.996330	.995420	.994465	2.99

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
2.50	.984301	.982824	.981407	.980056	.978774	.977562	2.50
2.51	.984571	.983103	.981694	.980349	.979071	.977864	2.51
2.52	.984838	.983379	.981977	.980638	.979365	.978161	2.52
2.53	.985100	.983650	.982256	980923	.979655	.978455	2.53
2.54	.985358	.983917	.982531	.981204	.979942	.978745	2.54
2.55	.985611	.984180	.982802	.981482	.980224	.979032	2.55
2.56	.985861	.984440	.983069	.981755	.980503	.979314	2.56
2.57	.986107	.984695	.983332	.982025	.980777	.979593	2.57
2.58	.986349	.984946	.983591	.982290	.981049	.979869	2.58
2.59	.986587	.985193	.983847	.982553	.981316	.980141	2.59
2.60	.986821	.985437	.984098	.982811	.981580	.980409	2.60
2.61	.987051	.985677	.984346	.983066	.981841	.980674	2.61
2.62	.987278	.985913	.984591	.983317	.982098	.980936	2.62
2.63	.987500	.986146	.984832	.983565	.982351	.981194	2.63
2.64	.987720	.986375	.985069	.983810	.982602	.981449	2.64
2.65	.987935	.986600	.985303	.984050	.982848	.981701	2.65
2.66	.988148	.986822	.985533	.984288	.983092	.981949	2.66
2.67	.988356	.987041	.985760	.984522	.983332	.982194	2.67
2.68	.988562	.987256	.985984	.984753	.983569	.982436	2.68
2.69	.988764	.987468	.986204	.984981	.983803	.982675	2.69
2.70	.988962	.987676	.986422	.985205	.984034	.982911	2.70
2.71	.989157	.987882	.986635	.985426	.984261	.983143	2.71
2.72	.989350	.988084	.986846	.985645	.984485	.983373	2.72
2.73	.989539	.988283	.987054	.985860	.984707	.983600	2.73
2.74	.989724	.988479	.987258	.986072	.984925	.983823	2.74
2.75	.989907	.988671	.987460	.986281	.985140	.984044	2.75
2.76	.990087	.988861	.987658	.986487	.985353	.984262	2.76
2.77	.990264	.989048	.987854	.986690	.985562	.984477	2.77
2.78	.990438	.989232	.988046	.986890	.985769	.984689	2.78
2.79	.990608	.989413	.988236	.987087	.985973	.984899	2.79
2.80	.990777	.989591	.988423	.987282	.986174	.985105	2.80
2.81	.990942	.989766	.988607	.987474	.986373	.985309	2.81
2.82	.991104	.989939	.988789	.987663	.986568	.985511	2.82
2.83	.991264	.990109	.988967	.987849	.986761	.985709	2.83
2.84	.991421	.990276	.989143	.988033	.986951	.985906	2.84
2.85	.991576	.990440	.989316	988214	.987139	.986099	2.85
2.86	.991727	.990602	.989487	.988392	.987324	.986290	2.86
2.87	.991877	.990761	.989655	.988568	.987507	.986478	2.87
2.88	.992024	.990918	.989821	.988741	.987687	.986664	2.88
2.89	.992168	.991072	.989984	.988912	.987865	.986848	2.89
2.90	.992310	.991224	.990144	.989080	.988040	.987029	2.90
2.91	.992449	.991373	.990302	.989246	.988213	.987208	2.91
2.92	.992586	.991520	.990458	.989410	.988383	.987384	2.92
2.93	.992721	.991665	.990612	.989571	.988551	.987558	2.93
2.94	.992853	.991807	.990763	.989730	.988717	.987730	2.94
2.95	.992984	.991947	.990911	.989886	.988880	.987899	2.95
2.96	.993112	.992085	.991058	.990041	.989041	.988066	2.96
2.97	.993237	.992220	.991202	.990193	.989200	.988231	2.97
2.98	.993361	.992353	.991344	.990343	.989357	.988394	2.98
2.99	.993482	.992485	.991484	.990490	.989512	.988555	2.99

t	SKEWNESS						t
	.0	.1	.2	.3	.4	.5	
3.00	.998650	.998001	.997250	.996415	.995517	.994574	3.00
3.01	.998694	.998058	.997320	.996498	.995613	.994681	3.01
3.02	.998736	.998114	.997389	.996580	.995706	.994786	3.02
3.03	.998777	.998168	.997456	.996659	.995798	.994889	3.03
3.04	.998817	.998220	.997521	.996737	.995888	.994990	3.04
3.05	.998856	.998272	.997585	.996813	.995976	.995089	3.05
3.06	.998893	.998322	.997647	.996888	.996062	.995186	3.06
3.07	.998930	.998370	.997708	.996961	.996147	.995282	3.07
3.08	.998965	.998417	.997767	.997032	.996229	.995376	3.08
3.09	.998999	.998463	.997825	.997102	.996311	.995467	3.09
3.10	.999032	.998508	.997882	.997170	.996390	.995558	3.10
3.11	.999065	.998552	.997937	.997237	.996468	.995646	3.11
3.12	.999096	.998594	.997991	.997302	.996545	.995733	3.12
3.13	.999126	.998635	.998044	.997366	.996619	.995819	3.13
3.14	.999155	.998675	.998095	.997429	.996693	.995902	3.14
3.15	.999184	.998714	.998145	.997490	.996765	.995984	3.15
3.16	.999211	.998752	.998194	.997550	.996835	.996065	3.16
3.17	.999238	.998789	.998241	.997608	.996904	.996144	3.17
3.18	.999264	.998825	.998288	.997665	.996971	.996221	3.18
3.19	.999289	.998860	.998333	.997721	.997038	.996298	3.19
3.20	.999313	.998894	.998377	.997775	.997102	.996372	3.20
3.21	.999336	.998927	.998420	.997829	.997166	.996445	3.21
3.22	.999359	.998959	.998462	.997881	.997228	.996517	3.22
3.23	.999381	.998990	.998503	.997932	.997289	.996588	3.23
3.24	.999402	.999020	.998543	.997982	.997348	.996657	3.24
3.25	.999423	.999050	.998582	.998031	.997407	.996725	3.25
3.26	.999443	.999079	.998620	.998078	.997464	.996791	3.26
3.27	.999462	.999106	.998657	.998125	.997520	.996856	3.27
3.28	.999481	.999134	.998694	.998170	.997575	.996920	3.28
3.29	.999499	.999160	.998729	.998215	.997629	.996983	3.29
3.30	.999517	.999185	.998763	.998258	.997681	.997045	3.30
3.31	.999534	.999210	.998797	.998300	.997733	.997105	3.31
3.32	.999550	.999234	.998829	.998342	.997783	.997164	3.32
3.33	.999566	.999258	.998861	.998382	.997832	.997222	3.33
3.34	.999581	.999281	.998892	.998422	.997881	.997279	3.34
3.35	.999596	.999303	.998922	.998461	.997928	.997335	3.35
3.36	.999610	.999324	.998952	.998499	.997974	.997390	3.36
3.37	.999624	.999345	.998980	.998535	.998020	.997443	3.37
3.38	.999638	.999365	.999008	.998572	.998064	.997496	3.38
3.39	.999651	.999385	.999035	.998607	.998107	.997547	3.39
3.40	.999663	.999404	.999062	.998641	.998150	.997598	3.40
3.41	.999675	.999423	.999088	.998675	.998192	.997648	3.41
3.42	.999687	.999441	.999113	.998708	.998232	.997696	3.42
3.43	.999698	.999458	.999138	.998740	.998272	.997744	3.43
3.44	.999709	.999475	.999161	.998771	.998311	.997791	3.44
3.45	.999720	.999492	.999185	.998802	.998349	.997837	3.45
3.46	.999730	.999508	.999207	.998831	.998387	.997881	3.46
3.47	.999740	.999523	.999229	.998861	.998423	.997926	3.47
3.48	.999749	.999538	.999251	.998889	.998459	.997969	3.48
3.49	.999759	.999553	.999272	.998917	.998494	.998011	3.49

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
3.00	.993602	.992614	.991622	.990636	.989664	.988713	3.00
3.01	.993719	.992741	.991757	.990779	.989814	.988869	3.01
3.02	.993834	.992865	.991891	.990920	.989962	.989024	3.02
3.03	.993948	.992988	.992022	.991060	.990109	.989176	3.03
3.04	.994059	.993109	.992152	.991197	.990253	.989326	3.04
3.05	.994169	.993228	.992279	.991332	.990395	.989474	3.05
3.06	.994276	.993345	.992405	.991465	.990535	.989621	3.06
3.07	.994382	.993460	.992528	.991596	.990673	.989765	3.07
3.08	.994486	.993573	.992650	.991726	.990809	.989907	3.08
3.09	.994588	.993684	.992770	.991853	.990943	.990048	3.09
3.10	.994688	.993794	.992888	.991979	.991076	.990186	3.10
3.11	.994786	.993902	.993004	.992102	.991206	.990323	3.11
3.12	.994883	.994008	.993118	.992224	.991335	.990458	3.12
3.13	.994978	.994112	.993230	.992344	.991462	.990591	3.13
3.14	.995072	.994214	.993341	.992463	.991587	.990722	3.14
3.15	.995163	.994315	.993450	.992579	.991711	.990851	3.15
3.16	.995254	.994414	.993558	.992694	.991832	.990979	3.16
3.17	.995342	.994511	.993663	.992807	.991952	.991105	3.17
3.18	.995429	.994607	.993767	.992919	.992070	.991229	3.18
3.19	.995515	.994702	.993870	.993029	.992187	.991352	3.19
3.20	.995599	.994794	.993970	.993137	.992302	.991473	3.20
3.21	.995681	.994885	.994070	.993243	.992415	.991592	3.21
3.22	.995762	.994975	.994167	.993348	.992527	.991710	3.22
3.23	.995842	.995063	.994263	.993452	.992637	.991826	3.23
3.24	.995920	.995150	.994358	.993554	.992746	.991941	3.24
3.25	.995997	.995235	.994451	.993654	.992853	.992054	3.25
3.26	.996072	.995319	.994543	.993753	.992958	.992166	3.26
3.27	.996146	.995401	.994633	.993850	.993062	.992276	3.27
3.28	.996219	.995482	.994722	.993946	.993165	.992384	3.28
3.29	.996290	.995562	.994809	.994041	.993266	.992491	3.29
3.30	.996360	.995640	.994895	.994134	.993365	.992597	3.30
3.31	.996429	.995717	.994980	.994226	.993464	.992701	3.31
3.32	.996497	.995793	.995063	.994316	.993560	.992804	3.32
3.33	.996563	.995868	.995145	.994405	.993656	.992905	3.33
3.34	.996629	.995941	.995226	.994492	.993750	.993005	3.34
3.35	.996693	.996013	.995305	.994579	.993843	.993103	3.35
3.36	.996756	.996083	.995383	.994664	.993934	.993201	3.36
3.37	.996817	.996153	.995460	.994748	.994024	.993297	3.37
3.38	.996878	.996221	.995536	.994830	.994113	.993391	3.38
3.39	.996938	.996289	.995610	.994911	.994200	.993485	3.39
3.40	.996996	.996355	.995683	.994991	.994287	.993577	3.40
3.41	.997054	.996420	.995755	.995070	.994372	.993667	3.41
3.42	.997110	.996483	.995826	.995148	.994456	.993757	3.42
3.43	.997165	.996546	.995896	.995224	.994538	.993845	3.43
3.44	.997220	.996608	.995965	.995299	.994620	.993932	3.44
3.45	.997273	.996669	.996032	.995374	.994700	.994018	3.45
3.46	.997325	.996728	.996099	.995447	.994779	.994103	3.46
3.47	.997377	.996787	.996164	.995519	.994857	.994187	3.47
3.48	.997427	.996844	.996229	.995589	.994934	.994269	3.48
3.49	.997477	.996901	.996292	.995659	.995009	.994350	3.49

t	SKEWNESS						t
	.0	.1	.2	.3	.4	.5	
3.50	.999767	.999567	.999292	.998944	.998528	.998053	3.50
3.51	.999776	.999581	.999312	.998971	.998562	.998093	3.51
3.52	.999784	.999594	.999331	.998996	.998595	.998133	3.52
3.53	.999792	.999607	.999350	.999022	.998627	.998172	3.53
3.54	.999800	.999620	.999368	.999046	.998658	.998210	3.54
3.55	.999807	.999632	.999386	.999070	.998689	.998248	3.55
3.56	.999815	.999644	.999404	.999094	.998719	.998285	3.56
3.57	.999822	.999655	.999420	.999117	.998748	.998321	3.57
3.58	.999828	.999666	.999437	.999139	.998777	.998356	3.58
3.59	.999835	.999677	.999453	.999161	.998805	.998391	3.59
3.60	.999841	.999688	.999468	.999183	.998833	.998425	3.60
3.61	.999847	.999698	.999484	.999203	.998860	.998458	3.61
3.62	.999853	.999708	.999498	.999224	.998886	.998490	3.62
3.63	.999858	.999717	.999513	.999243	.998912	.998522	3.63
3.64	.999864	.999726	.999527	.999263	.998937	.998554	3.64
3.65	.999869	.999735	.999540	.999282	.998962	.998584	3.65
3.66	.999874	.999744	.999553	.999300	.998986	.998614	3.66
3.67	.999879	.999752	.999566	.999318	.999009	.998644	3.67
3.68	.999883	.999760	.999579	.999336	.999032	.998673	3.68
3.69	.999888	.999768	.999591	.999353	.999055	.998701	3.69
3.70	.999892	.999776	.999603	.999369	.999077	.998728	3.70
3.71	.999896	.999783	.999614	.999386	.999098	.998756	3.71
3.72	.999900	.999791	.999626	.999402	.999119	.998782	3.72
3.73	.999904	.999798	.999636	.999417	.999140	.998808	3.73
3.74	.999908	.999804	.999647	.999432	.999160	.998834	3.74
3.75	.999912	.999811	.999657	.999447	.999180	.998859	3.75
3.76	.999915	.999817	.999667	.999461	.999199	.998883	3.76
3.77	.999918	.999823	.999677	.999475	.999218	.998907	3.77
3.78	.999922	.999829	.999686	.999489	.999236	.998930	3.78
3.79	.999925	.999835	.999696	.999502	.999254	.998953	3.79
3.80	.999928	.999840	.999705	.999515	.999272	.998976	3.80
3.81	.999931	.999846	.999713	.999528	.999289	.998998	3.81
3.82	.999933	.999851	.999722	.999540	.999306	.999020	3.82
3.83	.999936	.999856	.999730	.999553	.999322	.999041	3.83
3.84	.999938	.999861	.999738	.999564	.999338	.999061	3.84
3.85	.999941	.999866	.999746	.999576	.999354	.999082	3.85
3.86	.999943	.999870	.999753	.999587	.999369	.999102	3.86
3.87	.999946	.999875	.999761	.999598	.999384	.999121	3.87
3.88	.999948	.999879	.999768	.999608	.999399	.999140	3.88
3.89	.999950	.999883	.999775	.999619	.999413	.999159	3.89
3.90	.999952	.999887	.999781	.999629	.999427	.999177	3.90
3.91	.999954	.999891	.999788	.999639	.999441	.999195	3.91
3.92	.999956	.999895	.999794	.999648	.999454	.999212	3.92
3.93	.999958	.999898	.999800	.999658	.999467	.999230	3.93
3.94	.999959	.999902	.999806	.999667	.999480	.999246	3.94
3.95	.999961	.999905	.999812	.999676	.999493	.999263	3.95
3.96	.999963	.999909	.999818	.999684	.999505	.999279	3.96
3.97	.999964	.999912	.999823	.999693	.999517	.999295	3.97
3.98	.999966	.999915	.999829	.999701	.999528	.999310	3.98
3.99	.999967	.999918	.999834	.999709	.999540	.999325	3.99

t	SKEWNESS .6	.7	.8	.9	1.0	1.1	t
3.50	.997526	.996957	.996354	.995728	.995084	.994431	3.50
3.51	.997573	.997011	.996416	.995795	.995128	.994510	3.51
3.52	.997620	.997065	.996476	.995862	.995230	.994588	3.52
3.53	.997666	.997118	.996536	.995928	.995302	.994665	3.53
3.54	.997711	.997170	.996594	.995992	.995372	.994740	3.54
3.55	.997756	.997221	.996651	.996056	.995441	.994815	3.55
3.56	.997799	.997271	.996708	.996118	.995510	.994889	3.56
3.57	.997842	.997320	.996764	.996180	.995577	.994962	3.57
3.58	.997884	.997369	.996818	.996241	.995644	.995034	3.58
3.59	.997925	.997416	.996872	.996301	.995709	.995104	3.59
3.60	.997965	.997463	.996925	.996359	.995774	.995174	3.60
3.61	.998005	.997509	.996977	.996417	.995837	.995243	3.61
3.62	.998044	.997554	.997028	.996475	.995900	.995311	3.62
3.63	.998082	.997598	.997079	.996531	.995962	.995378	3.63
3.64	.998120	.997642	.997128	.996586	.996022	.995444	3.64
3.65	.998156	.997685	.997177	.996641	.996082	.995509	3.65
3.66	.998192	.997727	.997225	.996694	.996141	.995573	3.66
3.67	.998228	.997768	.997272	.996747	.996200	.995636	3.67
3.68	.998263	.997809	.997319	.996799	.996257	.995699	3.68
3.69	.998297	.997849	.997364	.996850	.996314	.995760	3.69
3.70	.998330	.997888	.997409	.996901	.996369	.995821	3.70
3.71	.998363	.997927	.997453	.996950	.996424	.995881	3.71
3.72	.998395	.997964	.997497	.996999	.996478	.995940	3.72
3.73	.998427	.998002	.997540	.997047	.996532	.995998	3.73
3.74	.998458	.998038	.997582	.997095	.996584	.996056	3.74
3.75	.998488	.998074	.997623	.997141	.996636	.996112	3.75
3.76	.998518	.998109	.997664	.997187	.996687	.996168	3.76
3.77	.998547	.998144	.997704	.997233	.996737	.996223	3.77
3.78	.998576	.998178	.997743	.997277	.996786	.996277	3.78
3.79	.998604	.998211	.997782	.997321	.996835	.996331	3.79
3.80	.998632	.998244	.997820	.997364	.996883	.996383	3.80
3.81	.998659	.998277	.997857	.997406	.996931	.996435	3.81
3.82	.998685	.998308	.997894	.997448	.996977	.996487	3.82
3.83	.998712	.998339	.997930	.997489	.997023	.996537	3.83
3.84	.998737	.998370	.997966	.997530	.997068	.996587	3.84
3.85	.998762	.998400	.998001	.997570	.997113	.996636	3.85
3.86	.998787	.998430	.998035	.997609	.997157	.996685	3.86
3.87	.998811	.998459	.998069	.997648	.997200	.996733	3.87
3.88	.998835	.998487	.998102	.997686	.997243	.996780	3.88
3.89	.998858	.998515	.998135	.997723	.997285	.996826	3.89
3.90	.998881	.998543	.998167	.997760	.997326	.996872	3.90
3.91	.998903	.998570	.998199	.997796	.997367	.996917	3.91
3.92	.998925	.998596	.998230	.997832	.997407	.996962	3.92
3.93	.998947	.998622	.998261	.997867	.997447	.997006	3.93
3.94	.998968	.998648	.998291	.997902	.997486	.997049	3.94
3.95	.998988	.998673	.998320	.997936	.997524	.997092	3.95
3.96	.999009	.998697	.998349	.997969	.997562	.997134	3.96
3.97	.999029	.998722	.998378	.998002	.997600	.997175	3.97
3.98	.999048	.998745	.998406	.998035	.997636	.997216	3.98
3.99	.999067	.998769	.998434	.998067	.997673	.997256	3.99

t	SKEWNESS						t
	.0	.1	.2	.3	.4	.5	
4.00	.999968	.999921	.999839	.999717	.999551	.999340	4.00
4.01	.999970	.999923	.999844	.999724	.999562	.999355	4.01
4.02	.999971	.999926	.999849	.999732	.999572	.999369	4.02
4.03	.999972	.999929	.999853	.999739	.999583	.999383	4.03
4.04	.999973	.999931	.999858	.999746	.999593	.999396	4.04
4.05	.999974	.999934	.999862	.999753	.999603	.999409	4.05
4.06	.999975	.999936	.999866	.999760	.999612	.999423	4.06
4.07	.999977	.999938	.999870	.999766	.999622	.999435	4.07
4.08	.999977	.999940	.999874	.999772	.999631	.999448	4.08
4.09	.999978	.999943	.999878	.999779	.999640	.999460	4.09
4.10	.999979	.999945	.999882	.999785	.999649	.999472	4.10
4.11	.999980	.999947	.999886	.999790	.999657	.999484	4.11
4.12	.999981	.999948	.999889	.999796	.999665	.999495	4.12
4.13	.999982	.999950	.999892	.999802	.999674	.999506	4.13
4.14	.999983	.999952	.999896	.999807	.999682	.999517	4.14
4.15	.999983	.999954	.999899	.999812	.999689	.999528	4.15
4.16	.999984	.999955	.999902	.999818	.999697	.999538	4.16
4.17	.999985	.999957	.999905	.999823	.999704	.999549	4.17
4.18	.999985	.999959	.999908	.999827	.999712	.999559	4.18
4.19	.999986	.999960	.999911	.999832	.999719	.999569	4.19
4.20	.999987	.999962	.999914	.999837	.999726	.999578	4.20
4.21	.999987	.999963	.999916	.999841	.999732	.999588	4.21
4.22	.999988	.999964	.999919	.999846	.999739	.999597	4.22
4.23	.999988	.999966	.999922	.999850	.999746	.999606	4.23
4.24	.999989	.999967	.999924	.999854	.999752	.999615	4.24
4.25	.999989	.999968	.999926	.999858	.999758	.999623	4.25
4.26	.999990	.999969	.999929	.999862	.999764	.999632	4.26
4.27	.999990	.999970	.999931	.999866	.999770	.999640	4.27
4.28	.999991	.999971	.999933	.999870	.999776	.999648	4.28
4.29	.999991	.999972	.999935	.999873	.999781	.999656	4.29
4.30	.999991	.999973	.999937	.999877	.999787	.999664	4.30
4.31	.999992	.999974	.999939	.999880	.999792	.999671	4.31
4.32	.999992	.999975	.999941	.999883	.999797	.999679	4.32
4.33	.999993	.999976	.999943	.999887	.999802	.999686	4.33
4.34	.999993	.999977	.999945	.999890	.999807	.999693	4.34
4.35	.999993	.999978	.999947	.999893	.999812	.999700	4.35
4.36	.999993	.999979	.999948	.999896	.999817	.999707	4.36
4.37	.999994	.999980	.999950	.999899	.999821	.999713	4.37
4.38	.999994	.999980	.999952	.999902	.999826	.999720	4.38
4.39	.999994	.999981	.999953	.999904	.999830	.999726	4.39
4.40	.999995	.999982	.999955	.999907	.999834	.999733	4.40
4.41	.999995	.999983	.999956	.999910	.999838	.999739	4.41
4.42	.999995	.999983	.999958	.999912	.999842	.999745	4.42
4.43	.999995	.999984	.999959	.999915	.999846	.999750	4.43
4.44	.999996	.999984	.999960	.999917	.999850	.999756	4.44
4.45	.999996	.999985	.999962	.999920	.999854	.999762	4.45
4.46	.999996	.999986	.999963	.999922	.999858	.999767	4.46
4.47	.999996	.999986	.999964	.999924	.999861	.999772	4.47
4.48	.999996	.999987	.999965	.999926	.999865	.999778	4.48
4.49	.999996	.999987	.999966	.999928	.999868	.999783	4.49

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
4.00	.999086	.998792	.998461	.998098	.997708	.997296	4.00
4.01	.999105	.998814	.998488	.998129	.997743	.997335	4.01
4.02	.999123	.998836	.998514	.998160	.997778	.997374	4.02
4.03	.999140	.998858	.998540	.998190	.997812	.997412	4.03
4.04	.999158	.998879	.998565	.998219	.997846	.997450	4.04
4.05	.999175	.998900	.998590	.998248	.997879	.997487	4.05
4.06	.999191	.998921	.998615	.998277	.997911	.997523	4.06
4.07	.999208	.998941	.998639	.998305	.997943	.997559	4.07
4.08	.999224	.998961	.998663	.998333	.997975	.997594	4.08
4.09	.999239	.998980	.998686	.998360	.998006	.997629	4.09
4.10	.999255	.999000	.998709	.998387	.998037	.997664	4.10
4.11	.999270	.999018	.998731	.998413	.998067	.997698	4.11
4.12	.999285	.999037	.998754	.998439	.998097	.997731	4.12
4.13	.999299	.999055	.998775	.998465	.998126	.997764	4.13
4.14	.999314	.999073	.998797	.998490	.998155	.997797	4.14
4.15	.999328	.999090	.998818	.998514	.998183	.997829	4.15
4.16	.999341	.999107	.998839	.998539	.998211	.997861	4.16
4.17	.999355	.999124	.998859	.998563	.998239	.997892	4.17
4.18	.999368	.999141	.998879	.998586	.998266	.997923	4.18
4.19	.999381	.999157	.998899	.998610	.998293	.997953	4.19
4.20	.999394	.999173	.998918	.998632	.998319	.997983	4.20
4.21	.999406	.999188	.998937	.998655	.998345	.998012	4.21
4.22	.999418	.999204	.998956	.998677	.998371	.998041	4.22
4.23	.999430	.999219	.998974	.998699	.998396	.998070	3.23
4.24	.999442	.999234	.998992	.998720	.998421	.998098	4.24
4.25	.999453	.999248	.999010	.998741	.998445	.998126	4.25
4.26	.999464	.999262	.999027	.998762	.998470	.998153	4.26
4.27	.999475	.999276	.999045	.998782	.998493	.998180	4.27
4.28	.999486	.999290	.999061	.998803	.998517	.998207	4.28
4.29	.999497	.999304	.999078	.998822	.998540	.998233	4.29
4.30	.999507	.999317	.999094	.998842	.998562	.998259	4.30
4.31	.999517	.999330	.999110	.998861	.998585	.998285	4.31
4.32	.999527	.999343	.999126	.998880	.998607	.998310	4.32
4.33	.999537	.999355	.999141	.998898	.998628	.998335	4.33
4.34	.999547	.999367	.999157	.998916	.998650	.998359	4.34
4.35	.999556	.999379	.999172	.998934	.998670	.998383	4.35
4.36	.999565	.999391	.999186	.998952	.998691	.998407	4.36
4.37	.999574	.999403	.999201	.998969	.998712	.998430	4.37
4.38	.999583	.999414	.999215	.998986	.998732	.998453	4.38
4.39	.999592	.999425	.999229	.999003	.998751	.998476	4.39
4.40	.999600	.999436	.999242	.999020	.998771	.998498	4.40
4.41	.999608	.999447	.999256	.999036	.998790	.998520	4.41
4.42	.999616	.999458	.999269	.999052	.998809	.998542	4.42
4.43	.999624	.999468	.999282	.999068	.998827	.998564	4.43
4.44	.999632	.999478	.999295	.999083	.998846	.998585	4.44
4.45	.999640	.999488	.999307	.999098	.998864	.998606	4.45
4.46	.999647	.999498	.999320	.999113	.998881	.998626	4.46
4.47	.999655	.999508	.999332	.999128	.998899	.998646	4.47
4.48	.999662	.999517	.999344	.999143	.998916	.998666	4.48
4.49	.999669	.999527	.999355	.999157	.998933	.998686	4.49

t	SKEWNESS						t
	.0	.1	.2	.3	.4	.5	
4.50	.999997	.999988	.999967	.999930	.999872	.999788	4.50
4.51	.999997	.999988	.999968	.999932	.999875	.999792	4.51
4.52	.999997	.999989	.999969	.999934	.999878	.999797	4.52
4.53	.999997	.999989	.999970	.999936	.999881	.999802	4.53
4.54	.999997	.999989	.999971	.999938	.999884	.999806	4.54
4.55	.999997	.999990	.999972	.999940	.999887	.999811	4.55
4.56	.999997	.999990	.999973	.999941	.999890	.999815	4.56
4.57	.999998	.999991	.999974	.999943	.999893	.999819	4.57
4.58	.999998	.999991	.999975	.999945	.999896	.999824	4.58
4.59	.999998	.999991	.999976	.999946	.999898	.999828	4.59
4.60	.999998	.999992	.999977	.999948	.999901	.999832	4.60
4.61	.999998	.999992	.999977	.999949	.999903	.999836	4.61
4.62	.999998	.999992	.999978	.999951	.999906	.999839	4.62
4.63	.999998	.999993	.999979	.999952	.999908	.999843	4.63
4.64	.999998	.999993	.999980	.999954	.999911	.999847	4.64
4.65	.999998	.999993	.999980	.999955	.999913	.999850	4.65
4.66	.999998	.999993	.999981	.999956	.999915	.999854	4.66
4.67	.999998	.999994	.999982	.999958	.999917	.999857	4.67
4.68	.999999	.999994	.999982	.999959	.999919	.999860	4.68
4.69	.999999	.999994	.999983	.999960	.999922	.999864	4.69
4.70	.999999	.999994	.999983	.999961	.999924	.999867	4.70
4.71	.999999	.999995	.999984	.999962	.999926	.999870	4.71
4.72	.999999	.999995	.999984	.999963	.999927	.999873	4.72
4.73	.999999	.999995	.999985	.999964	.999929	.999876	4.73
4.74	.999999	.999995	.999985	.999965	.999931	.999879	4.74
4.75	.999999	.999995	.999986	.999966	.999933	.999882	4.75
4.76	.999999	.999996	.999986	.999967	.999935	.999884	4.76
4.77	.999999	.999996	.999987	.999968	.999936	.999887	4.77
4.78	.999999	.999996	.999987	.999969	.999938	.999890	4.78
4.79	.999999	.999996	.999988	.999970	.999940	.999892	4.79
4.80	.999999	.999996	.999988	.999971	.999941	.999895	4.80
4.81	.999999	.999996	.999989	.999972	.999943	.999897	4.81
4.82	.999999	.999997	.999989	.999973	.999944	.999900	4.82
4.83	.999999	.999997	.999989	.999974	.999946	.999902	4.83
4.84	.999999	.999997	.999990	.999974	.999947	.999904	4.84
4.85	.999999	.999997	.999990	.999975	.999948	.999907	4.85
4.86	.999999	.999997	.999990	.999976	.999950	.999909	4.86
4.87	.999999	.999997	.999991	.999977	.999951	.999911	4.87
4.88	.999999	.999997	.999991	.999977	.999952	.999913	4.88
4.89	.999999	.999997	.999991	.999978	.999954	.999915	4.89
4.90		.999998	.999992	.999979	.999955	.999917	4.90
4.91		.999998	.999992	.999979	.999956	.999919	4.91
4.92		.999998	.999992	.999980	.999957	.999921	4.92
4.93		.999998	.999992	.999980	.999958	.999923	4.93
4.94		.999998	.999993	.999981	.999959	.999925	4.94
4.95		.999998	.999993	.999982	.999961	.999926	4.95
4.96		.999998	.999993	.999982	.999962	.999928	4.96
4.97		.999998	.999993	.999983	.999963	.999930	4.97
4.98		.999998	.999994	.999983	.999964	.999932	4.98
4.99		.999998	.999994	.999984	.999965	.999933	4.99

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
4.50	.999676	.999536	.999367	.999171	.998950	.998705	4.50
4.51	.999683	.999545	.999378	.999185	.998966	.998724	4.51
4.52	.999689	.999553	.999389	.999198	.998982	.998743	4.52
4.53	.999696	.999562	.999400	.999212	.998998	.998762	4.53
4.54	.999702	.999570	.999411	.999225	.999014	.998780	4.54
4.55	.999708	.999579	.999422	.999238	.999029	.998798	4.55
4.56	.999715	.999587	.999432	.999251	.999045	.998816	4.56
4.57	.999721	.999595	.999442	.999263	.999060	.998833	4.57
4.58	.999726	.999603	.999452	.999275	.999074	.998850	4.58
4.59	.999732	.999610	.999462	.999288	.999089	.998867	4.59
4.60	.999738	.999618	.999472	.999300	.999103	.998884	4.60
4.61	.999743	.999625	.999481	.999311	.999117	.998901	4.61
4.62	.999749	.999632	.999490	.999323	.999131	.998917	4.62
4.63	.999754	.999640	.999499	.999334	.999145	.998933	4.63
4.64	.999759	.999647	.999508	.999345	.999158	.998949	4.64
4.65	.999764	.999653	.999517	.999356	.999171	.998964	4.65
4.66	.999769	.999660	.999526	.999367	.999184	.998980	4.66
4.67	.999774	.999667	.999535	.999378	.999197	.998995	4.67
4.68	.999779	.999673	.999543	.999388	.999210	.999010	4.68
4.69	.999784	.999680	.999551	.999398	.999222	.999024	4.69
4.70	.999788	.999686	.999559	.999408	.999235	.999039	4.70
4.71	.999793	.999692	.999567	.999418	.999247	.999053	4.71
4.72	.999797	.999698	.999575	.999428	.999258	.999067	4.72
4.73	.999801	.999704	.999583	.999438	.999270	.999081	4.73
4.74	.999806	.999710	.999590	.999447	.999282	.999095	4.74
4.75	.999810	.999715	.999598	.999457	.999293	.999108	4.75
4.76	.999814	.999721	.999605	.999466	.999304	.999121	4.76
4.77	.999818	.999726	.999612	.999475	.999315	.999134	4.77
4.78	.999822	.999732	.999619	.999484	.999326	.999147	4.78
4.79	.999825	.999737	.999626	.999492	.999337	.999160	4.79
4.80	.999829	.999742	.999633	.999501	.999347	.999173	4.80
4.81	.999833	.999747	.999639	.999509	.999357	.999185	4.81
4.82	.999836	.999752	.999646	.999518	.999368	.999197	4.82
4.83	.999840	.999757	.999652	.999526	.999378	.999209	4.83
4.84	.999843	.999762	.999659	.999534	.999387	.999221	4.84
4.85	.999847	.999766	.999665	.999542	.999397	.999232	4.85
4.86	.999850	.999771	.999671	.999549	.999407	.999244	4.86
4.87	.999853	.999775	.999677	.999557	.999416	.999255	4.87
4.88	.999856	.999780	.999683	.999564	.999425	.999266	4.88
4.89	.999859	.999784	.999688	.999572	.999434	.999277	4.89
4.90	.999862	.999788	.999694	.999579	.999443	.999288	4.90
4.91	.999865	.999793	.999700	.999586	.999452	.999298	4.91
4.92	.999868	.999797	.999705	.999593	.999461	.999309	4.92
4.93	.999871	.999801	.999711	.999600	.999469	.999319	4.93
4.94	.999874	.999805	.999716	.999607	.999478	.999329	4.94
4.95	.999876	.999808	.999721	.999614	.999486	.999339	4.95
4.96	.999879	.999812	.999726	.999620	.999494	.999349	4.96
4.97	.999882	.999816	.999731	.999627	.999502	.999359	4.97
4.98	.999884	.999820	.999736	.999633	.999510	.999369	4.98
4.99	.999887	.999823	.999741	.999639	.999518	.999378	4.99

t	SKEWNESS						t
	.0	.1	.2	.3	.4	.5	
5.00		.999998	.999994	.999984	.999965	.999935	5.00
5.01		.999998	.999994	.999985	.999966	.999936	5.01
5.02		.999998	.999994	.999985	.999967	.999938	5.02
5.03		.999999	.999995	.999986	.999968	.999939	5.03
5.04		.999999	.999995	.999986	.999969	.999941	5.04
5.05		.999999	.999995	.999986	.999970	.999942	5.05
5.06		.999999	.999995	.999987	.999971	.999943	5.06
5.07		.999999	.999995	.999987	.999971	.999945	5.07
5.08		.999999	.999996	.999988	.999972	.999946	5.08
5.09		.999999	.999996	.999988	.999973	.999947	5.09
5.10		.999999	.999996	.999988	.999974	.999949	5.10
5.11		.999999	.999996	.999989	.999974	.999950	5.11
5.12		.999999	.999996	.999989	.999975	.999951	5.12
5.13		.999999	.999996	.999989	.999976	.999952	5.13
5.14		.999999	.999996	.999990	.999976	.999953	5.14
5.15		.999999	.999997	.999990	.999977	.999955	5.15
5.16		.999999	.999997	.999990	.999978	.999956	5.16
5.17		.999999	.999997	.999991	.999978	.999957	5.17
5.18		.999999	.999997	.999991	.999979	.999958	5.18
5.19		.999999	.999997	.999991	.999979	.999959	5.19
5.20		.999999	.999997	.999991	.999980	.999960	5.20
5.21		.999999	.999997	.999992	.999980	.999961	5.21
5.22		.999999	.999997	.999992	.999980	.999962	5.22
5.23		.999999	.999997	.999992	.999981	.999963	5.23
5.24		.999999	.999997	.999992	.999982	.999963	5.24
5.25		.999999	.999998	.999993	.999982	.999964	5.25
5.26		.999999	.999998	.999993	.999983	.999965	5.26
5.27		.999999	.999998	.999993	.999983	.999966	5.27
5.28			.999998	.999993	.999984	.999967	5.28
5.29			.999998	.999994	.999984	.999968	5.29
5.30			.999998	.999994	.999985	.999968	5.30
5.31			.999998	.999994	.999985	.999969	5.31
5.32			.999998	.999994	.999986	.999970	5.32
5.33			.999998	.999994	.999986	.999971	5.33
5.34			.999998	.999994	.999986	.999971	5.34
5.35			.999998	.999995	.999987	.999972	5.35
5.36			.999998	.999995	.999987	.999973	5.36
5.37			.999998	.999995	.999987	.999973	5.37
5.38			.999998	.999995	.999988	.999974	5.38
5.39			.999999	.999995	.999988	.999975	5.39
5.40			.999999	.999995	.999988	.999975	5.40
5.41			.999999	.999996	.999989	.999976	5.41
5.42			.999999	.999996	.999989	.999977	5.42
5.43			.999999	.999996	.999989	.999977	5.43
5.44			.999999	.999996	.999990	.999978	5.44
5.45			.999999	.999996	.999990	.999978	5.45
5.46			.999999	.999996	.999990	.999979	5.46
5.47			.999999	.999996	.999990	.999979	5.47
5.48			.999999	.999996	.999991	.999980	5.48
5.49			.999999	.999997	.999991	.999980	5.49

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
5.00	.999889	.999827	.999746	.999645	.999526	.999387	5.00
5.01	.999892	.999830	.999750	.999651	.999533	.999397	5.01
5.02	.999894	.999833	.999755	.999657	.999541	.999406	5.02
5.03	.999896	.999837	.999759	.999663	.999548	.999414	5.03
5.04	.999898	.999840	.999764	.999669	.999555	.999423	5.04
5.05	.999901	.999843	.999768	.999674	.999562	.999432	5.05
5.06	.999903	.999846	.999772	.999680	.999569	.999440	5.06
5.07	.999905	.999849	.999776	.999685	.999576	.999449	5.07
5.08	.999907	.999852	.999781	.999691	.999583	.999457	5.08
5.09	.999909	.999855	.999785	.999696	.999590	.999465	5.09
5.10	.999911	.999858	.999788	.999701	.999596	.999473	5.10
5.11	.999913	.999861	.999792	.999706	.999603	.999481	5.11
5.12	.999915	.999864	.999796	.999711	.999609	.999489	5.12
5.13	.999917	.999866	.999800	.999716	.999615	.999497	5.13
5.14	.999918	.999869	.999804	.999721	.999621	.999504	5.14
5.15	.999920	.999872	.999807	.999726	.999627	.999512	5.15
5.16	.999922	.999874	.999811	.999731	.999633	.999519	5.16
5.17	.999924	.999877	.999814	.999735	.999639	.999526	5.17
5.18	.999925	.999879	.999818	.999740	.999645	.999533	5.18
5.19	.999927	.999882	.999821	.999744	.999651	.999540	5.19
5.20	.999928	.999884	.999824	.999749	.999656	.999547	5.20
5.21	.999930	.999886	.999828	.999753	.999662	.999554	5.21
5.22	.999932	.999888	.999831	.999757	.999667	.999561	5.22
5.23	.999933	.999891	.999834	.999761	.999672	.999567	5.23
5.24	.999935	.999893	.999837	.999765	.999678	.999574	5.24
5.25	.999936	.999895	.999840	.999769	.999683	.999580	5.25
5.26	.999937	.999897	.999843	.999773	.999688	.999587	5.26
5.27	.999939	.999899	.999846	.999777	.999693	.999593	5.27
5.28	.999940	.999901	.999849	.999781	.999698	.999599	5.28
5.29	.999941	.999903	.999851	.999785	.999703	.999605	5.29
5.30	.999943	.999905	.999854	.999789	.999708	.999611	5.30
5.31	.999944	.999907	.999857	.999792	.999712	.999617	5.31
5.32	.999945	.999909	.999860	.999796	.999717	.999623	5.32
5.33	.999946	.999911	.999862	.999799	.999721	.999628	5.33
5.34	.999948	.999913	.999865	.999803	.999926	.999634	5.34
5.35	.999949	.999914	.999867	.999806	.999730	.999639	5.35
5.36	.999950	.999916	.999870	.999809	.999735	.999645	5.36
5.37	.999951	.999918	.999872	.999813	.999739	.999650	5.37
5.38	.999952	.999919	.999874	.999816	.999743	.999656	5.38
5.39	.999953	.999921	.999877	.999819	.999747	.999661	5.39
5.40	.999954	.999923	.999879	.999822	.999751	.999666	5.40
5.41	.999955	.999924	.999881	.999825	.999755	.999671	5.41
5.42	.999956	.999926	.999884	.999828	.999759	.999676	5.42
5.43	.999957	.999927	.999886	.999831	.999763	.999681	5.43
5.44	.999958	.999929	.999888	.999834	.999767	.999686	5.44
5.45	.999959	.999930	.999890	.999837	.999771	.999690	5.45
5.46	.999960	.999931	.999892	.999840	.999774	.999695	5.46
5.47	.999961	.999933	.999894	.999843	.999778	.999700	5.47
5.48	.999962	.999934	.999896	.999845	.999782	.999704	5.48
5.49	.999962	.999936	.999898	.999848	.999785	.999709	5.49

t	SKEWNESS .0	.1	.2	.3	.4	.5	t
5.50			.999999	.999997	.999991	.999981	5.50
5.51			.999999	.999997	.999991	.999981	5.51
5.52			.999999	.999997	.999992	.999982	5.52
5.53			.999999	.999997	.999992	.999982	5.53
5.54			.999999	.999997	.999992	.999983	5.54
5.55			.999999	.999997	.999992	.999983	5.55
5.56			.999999	.999997	.999993	.999983	5.56
5.57			.999999	.999997	.999993	.999984	5.57
5.58			.999999	.999997	.999993	.999984	5.58
5.59			.999999	.999997	.999993	.999985	5.59
5.60			.999999	.999998	.999993	.999985	5.60
5.61			.999999	.999998	.999994	.999985	5.61
5.62			.999999	.999998	.999994	.999986	5.62
5.63			.999999	.999998	.999994	.999986	5.63
5.64			.999999	.999998	.999994	.999986	5.64
5.65			.999999	.999998	.999994	.999987	5.65
5.66			.999999	.999998	.999994	.999987	5.66
5.67			.999999	.999998	.999995	.999987	5.67
5.68				.999998	.999995	.999988	5.68
5.69				.999998	.999995	.999988	5.69
5.70				.999998	.999995	.999988	5.70
5.71				.999998	.999995	.999989	5.71
5.72				.999998	.999995	.999989	5.72
5.73				.999998	.999995	.999989	5.73
5.74				.999998	.999996	.999989	5.74
5.75				.999999	.999996	.999990	5.75
5.76				.999999	.999996	.999990	5.76
5.77				.999999	.999996	.999990	5.77
5.78				.999999	.999996	.999990	5.78
5.79				.999999	.999996	.999991	5.79
5.80				.999999	.999996	.999991	5.80
5.81				.999999	.999996	.999991	5.81
5.82				.999999	.999996	.999991	5.82
5.83				.999999	.999997	.999992	5.83
5.84				.999999	.999997	.999992	5.84
5.85				.999999	.999997	.999992	5.85
5.86				.999999	.999997	.999992	5.86
5.87				.999999	.999997	.999992	5.87
5.88				.999999	.999997	.999993	5.88
5.89				.999999	.999997	.999993	5.89
5.90				.999999	.999997	.999993	5.90
5.91				.999999	.999997	.999993	5.91
5.92				.999999	.999997	.999993	5.92
5.93				.999999	.999997	.999993	5.93
5.94				.999999	.999997	.999994	5.94
5.95				.999999	.999998	.999994	5.95
5.96				.999999	.999998	.999994	5.96
5.97				.999999	.999998	.999994	5.97
5.98				.999999	.999998	.999994	5.98
5.99				.999999	.999998	.999994	5.99

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
5.50	.999963	.999937	.999900	.999851	.999789	.999713	5.50
5.51	.999964	.999938	.999902	.999853	.999792	.999717	5.51
5.52	.999965	.999939	.999903	.999856	.999795	.999722	5.52
5.53	.999966	.999941	.999905	.999858	.999799	.999726	5.53
5.54	.999966	.999942	.999907	.999861	.999802	.999730	5.54
5.55	.999967	.999943	.999909	.999863	.999805	.999734	5.55
5.56	.999968	.999944	.999910	.999866	.999808	.999738	5.56
5.57	.999969	.999945	.999912	.999868	.999811	.999742	5.57
5.58	.999969	.999946	.999914	.999870	.999814	.999746	5.58
5.59	.999970	.999947	.999915	.999872	.999817	.999750	5.59
5.60	.999971	.999949	.999917	.999875	.999820	.999754	5.60
5.61	.999971	.999950	.999919	.999877	.999823	.999758	5.61
5.62	.999972	.999951	.999920	.999879	.999826	.999761	5.62
5.63	.999973	.999952	.999922	.999881	.999829	.999765	5.63
5.64	.999973	.999953	.999923	.999883	.999832	.999768	5.64
5.65	.999974	.999954	.999924	.999885	.999835	.999772	5.65
5.66	.999974	.999955	.999926	.999887	.999837	.999775	5.66
5.67	.999975	.999955	.999927	.999889	.999840	.999779	5.67
5.68	.999976	.999956	.999929	.999891	.999842	.999782	5.68
5.69	.999976	.999957	.999930	.999893	.999845	.999786	5.69
5.70	.999977	.999958	.999931	.999895	.999848	.999789	5.70
5.71	.999977	.999959	.999933	.999897	.999850	.999792	5.71
5.72	.999978	.999960	.999934	.999898	.999852	.999795	5.72
5.73	.999978	.999961	.999935	.999900	.999855	.999798	5.73
5.74	.999979	.999961	.999936	.999902	.999857	.999801	5.74
5.75	.999979	.999962	.999938	.999904	.999859	.999804	5.75
5.76	.999980	.999963	.999939	.999905	.999862	.999807	5.76
5.77	.999980	.999964	.999940	.999907	.999864	.999810	5.77
5.78	.999980	.999965	.999941	.999909	.999866	.999813	5.78
5.79	.999981	.999965	.999942	.999910	.999868	.999816	5.79
5.80	.999981	.999966	.999943	.999912	.999871	.999819	5.80
5.81	.999982	.999967	.999944	.999913	.999873	.999822	5.81
5.82	.999982	.999967	.999945	.999915	.999875	.999824	5.82
5.83	.999983	.999968	.999946	.999916	.999877	.999827	5.83
5.84	.999983	.999969	.999947	.999918	.999879	.999830	5.84
5.85	.999983	.999969	.999948	.999919	.999881	.999832	5.85
5.86	.999984	.999970	.999949	.999921	.999883	.999835	5.86
5.87	.999984	.999971	.999950	.999922	.999885	.999837	5.87
5.88	.999984	.999971	.999951	.999923	.999887	.999840	5.88
5.89	.999985	.999972	.999952	.999925	.999888	.999842	5.89
5.90	.999985	.999972	.999953	.999926	.999890	.999845	5.90
5.91	.999985	.999973	.999954	.999927	.999892	.999847	5.91
5.92	.999986	.999973	.999955	.999929	.999894	.999849	5.92
5.93	.999986	.999974	.999956	.999930	.999895	.999852	5.93
5.94	.999986	.999975	.999957	.999931	.999897	.999854	5.94
5.95	.999987	.999975	.999957	.999932	.999899	.999856	5.95
5.96	.999987	.999976	.999958	.999933	.999901	.999858	5.96
5.97	.999987	.999976	.999959	.999935	.999902	.999861	5.97
5.98	.999988	.999977	.999960	.999936	.999904	.999863	5.98
5.99	.999988	.999977	.999960	.999937	.999905	.999865	5.99

t	SKEWNESS						t
	.0	.1	.2	.3	.4	.5	
6.00				.999999	.999998	.999995	6.00
6.01				.999999	.999998	.999995	6.01
6.02				.999999	.999998	.999995	6.02
6.03				.999999	.999998	.999995	6.03
6.04				.999999	.999998	.999995	6.04
6.05				.999999	.999998	.999995	6.05
6.06				.999999	.999998	.999995	6.06
6.07				.999999	.999998	.999995	6.07
6.08				.999999	.999998	.999996	6.08
6.09					.999998	.999996	6.09
6.10					.999998	.999996	6.10
6.11					.999998	.999996	6.11
6.12					.999998	.999996	6.12
6.13					.999999	.999996	6.13
6.14					.999999	.999996	6.14
6.15					.999999	.999996	6.15
6.16					.999999	.999996	6.16
6.17					.999999	.999996	6.17
6.18					.999999	.999997	6.18
6.19					.999999	.999997	6.19
6.20					.999999	.999997	6.20
6.21					.999999	.999997	6.21
6.22					.999999	.999997	6.22
6.23					.999999	.999997	6.23
6.24					.999999	.999997	6.24
6.25					.999999	.999997	6.25
6.26					.999999	.999997	6.26
6.27					.999999	.999997	6.27
6.28					.999999	.999997	6.28
6.29					.999999	.999997	6.29
6.30					.999999	.999997	6.30
6.31					.999999	.999998	6.31
6.32					.999999	.999998	6.32
6.33					.999999	.999998	6.33
6.34					.999999	.999998	6.34
6.35					.999999	.999998	6.35
6.36					.999999	.999998	6.36
6.37					.999999	.999998	6.37
6.38					.999999	.999998	6.38
6.39					.999999	.999998	6.39
6.40					.999999	.999998	6.40
6.41					.999999	.999998	6.41
6.42					.999999	.999998	6.42
6.43					.999999	.999998	6.43
6.44					.999999	.999998	6.44
6.45					.999999	.999998	6.45
6.46					.999999	.999998	6.46
6.47					.999999	.999998	6.47
6.48					.999999	.999998	6.48
6.49					.999999	.999998	6.49

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
6.00	.999988	.999978	.999961	.999938	.999907	.999867	6.00
6.01	.999988	.999978	.999962	.999939	.999908	.999869	6.01
6.02	.999989	.999978	.999963	.999940	.999910	.999871	6.02
6.03	.999989	.999979	.999963	.999941	.999911	.999873	6.03
6.04	.999989	.999979	.999964	.999942	.999913	.999875	6.04
6.05	.999989	.999980	.999965	.999943	.999914	.999877	6.05
6.06	.999990	.999980	.999965	.999944	.999916	.999879	6.06
6.07	.999990	.999981	.999966	.999945	.999917	.999881	6.07
6.08	.999990	.999981	.999967	.999946	.999918	.999882	6.08
6.09	.999990	.999981	.999967	.999947	.999920	.999884	6.09
6.10	.999991	.999982	.999968	.999948	.999921	.999886	6.10
6.11	.999991	.999982	.999969	.999949	.999922	.999888	6.11
6.12	.999991	.999983	.999969	.999950	.999924	.999889	6.12
6.13	.999991	.999983	.999970	.999951	.999925	.999891	6.13
6.14	.999991	.999983	.999970	.999952	.999926	.999893	6.14
6.15	.999992	.999984	.999971	.999953	.999927	.999894	6.15
6.16	.999992	.999984	.999971	.999953	.999929	.999896	6.16
6.17	.999992	.999984	.999972	.999954	.999930	.999898	6.17
6.18	.999992	.999985	.999973	.999955	.999931	.999899	6.18
6.19	.999992	.999985	.999973	.999956	.999932	.999901	6.19
6.20	.999993	.999985	.999974	.999957	.999933	.999902	6.20
6.21	.999993	.999986	.999974	.999957	.999934	.999904	6.21
6.22	.999993	.999986	.999975	.999958	.999935	.999905	6.22
6.23	.999993	.999986	.999975	.999959	.999936	.999907	6.23
6.24	.999993	.999986	.999976	.999960	.999937	.999908	6.24
6.25	.999993	.999987	.999976	.999960	.999938	.999910	6.25
6.26	.999994	.999987	.999976	.999961	.999939	.999911	6.26
6.27	.999994	.999987	.999977	.999962	.999940	.999912	6.27
6.28	.999994	.999988	.999977	.999962	.999941	.999914	6.28
6.29	.999994	.999988	.999978	.999963	.999942	.999915	6.29
6.30	.999994	.999988	.999978	.999964	.999943	.999916	6.30
6.31	.999994	.999988	.999979	.999964	.999944	.999918	6.31
6.32	.999994	.999989	.999979	.999965	.999945	.999919	6.32
6.33	.999994	.999989	.999979	.999966	.999946	.999920	6.33
6.34	.999995	.999989	.999980	.999966	.999947	.999921	6.34
6.35	.999995	.999989	.999980	.999967	.999948	.999923	6.35
6.36	.999995	.999989	.999981	.999967	.999949	.999924	6.36
6.37	.999995	.999990	.999981	.999968	.999950	.999925	6.37
6.38	.999995	.999990	.999981	.999969	.999950	.999926	6.38
6.39	.999995	.999990	.999982	.999969	.999951	.999927	6.39
6.40	.999995	.999990	.999982	.999970	.999952	.999928	6.40
6.41	.999995	.999991	.999982	.999970	.999953	.999930	6.41
6.42	.999996	.999991	.999983	.999971	.999954	.999931	6.42
6.43	.999996	.999991	.999983	.999971	.999954	.999932	6.43
6.44	.999996	.999991	.999983	.999972	.999955	.999933	6.44
6.45	.999996	.999991	.999984	.999972	.999956	.999934	6.45
6.46	.999996	.999991	.999984	.999973	.999957	.999935	6.46
6.47	.999996	.999992	.999984	.999973	.999957	.999936	6.47
6.48	.999996	.999992	.999985	.999974	.999958	.999937	6.48
6.49	.999996	.999992	.999985	.999974	.999959	.999938	6.49

t	SKEWNESS						t
	.0	.1	.2	.3	.4	.5	
6.50						.999999	6.50
6.51						.999999	6.51
6.52						.999999	6.52
6.53						.999999	6.53
6.54						.999999	6.54
6.55						.999999	6.55
6.56						.999999	6.56
6.57						.999999	6.57
6.58						.999999	6.58
6.59						.999999	6.59
6.60						.999999	6.60
6.61						.999999	6.61
6.62						.999999	6.62
6.63						.999999	6.63
6.64						.999999	6.64
6.65						.999999	6.65
6.66						.999999	6.66
6.67						.999999	6.67
6.68						.999999	6.68
6.69						.999999	6.69
6.70						.999999	6.70
6.71						.999999	6.71
6.72						.999999	6.72
6.73						.999999	6.73
6.74						.999999	6.74
6.75						.999999	6.75
6.76						.999999	6.76
6.77						.999999	6.77
6.78						.999999	6.78
6.79						.999999	6.79
6.80						.999999	6.80
6.81						.999999	6.81
6.82						.999999	6.82
6.83						.999999	6.83
6.84						.999999	6.84
6.85						.999999	6.85
6.86						.999999	6.86
6.87						.999999	6.87
6.88						.999999	6.88
6.89						.999999	6.89
6.90						.999999	6.90
6.91						.999999	6.91
6.92							6.92
6.93							6.93
6.94							6.94
6.95							6.95
6.96							6.96
6.97							6.97
6.98							6.98
6.99							6.99

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
6.50	.999996	.999992	.999985	.999975	.999959	.999939	6.50
6.51	.999996	.999992	.999986	.999975	.999960	.999940	6.51
6.52	.999996	.999992	.999986	.999976	.999961	.999941	6.52
6.53	.999997	.999993	.999986	.999976	.999961	.999942	6.53
6.54	.999997	.999993	.999986	.999976	.999962	.999942	6.54
6.55	.999997	.999993	.999987	.999977	.999963	.999943	6.55
6.56	.999997	.999993	.999987	.999977	.999963	.999944	6.56
6.57	.999997	.999993	.999987	.999978	.999964	.999945	6.57
6.58	.999997	.999993	.999987	.999978	.999964	.999946	6.58
6.59	.999997	.999994	.999988	.999978	.999965	.999947	6.59
6.60	.999997	.999994	.999988	.999979	.999966	.999948	6.60
6.61	.999997	.999994	.999988	.999979	.999966	.999948	6.61
6.62	.999997	.999994	.999988	.999980	.999967	.999949	6.62
6.63	.999997	.999994	.999989	.999980	.999967	.999950	6.63
6.64	.999997	.999994	.999989	.999980	.999968	.999951	6.64
6.65	.999997	.999994	.999989	.999981	.999968	.999952	6.65
6.66	.999997	.999994	.999989	.999981	.999969	.999952	6.66
6.67	.999998	.999995	.999989	.999981	.999969	.999953	6.67
6.68	.999998	.999995	.999990	.999982	.999970	.999954	6.68
6.69	.999998	.999995	.999990	.999982	.999970	.999954	6.69
6.70	.999998	.999995	.999990	.999982	.999971	.999955	6.70
6.71	.999998	.999995	.999990	.999983	.999971	.999956	6.71
6.72	.999998	.999995	.999990	.999983	.999972	.999957	6.72
6.73	.999998	.999995	.999991	.999983	.999972	.999957	6.73
6.74	.999998	.999995	.999991	.999984	.999973	.999958	6.74
6.75	.999998	.999995	.999991	.999984	.999973	.999959	6.75
6.76	.999998	.999996	.999991	.999984	.999974	.999959	6.76
6.77	.999998	.999996	.999991	.999984	.999974	.999960	6.77
6.78	.999998	.999996	.999991	.999985	.999975	.999960	6.78
6.79	.999998	.999996	.999992	.999985	.999975	.999961	6.79
6.80	.999998	.999996	.999992	.999985	.999975	.999962	6.80
6.81	.999998	.999996	.999992	.999985	.999976	.999962	6.81
6.82	.999998	.999996	.999992	.999986	.999976	.999963	6.82
6.83	.999998	.999996	.999992	.999986	.999977	.999963	6.83
6.84	.999998	.999996	.999992	.999986	.999977	.999964	6.84
6.85	.999998	.999996	.999993	.999986	.999977	.999965	6.85
6.86	.999998	.999996	.999993	.999987	.999978	.999965	6.86
6.87	.999998	.999996	.999993	.999987	.999978	.999966	6.87
6.88	.999998	.999997	.999993	.999987	.999979	.999966	6.88
6.89	.999999	.999997	.999993	.999987	.999979	.999967	6.89
6.90	.999999	.999997	.999993	.999988	.999979	.999967	6.90
6.91	.999999	.999997	.999993	.999988	.999980	.999968	6.91
6.92	.999999	.999997	.999994	.999988	.999980	.999968	6.92
6.93	.999999	.999997	.999994	.999988	.999980	.999969	6.93
6.94	.999999	.999997	.999994	.999989	.999981	.999969	6.94
6.95	.999999	.999997	.999994	.999989	.999981	.999970	6.95
6.96	.999999	.999997	.999994	.999989	.999981	.999970	6.96
6.97	.999999	.999997	.999994	.999989	.999982	.999971	6.97
6.98	.999999	.999997	.999994	.999989	.999982	.999971	6.98
6.99	.999999	.999997	.999994	.999990	.999982	.999972	6.99

t	SKEWNESS						t
	.0	.1	.2	.3	.4	.5	
7.00							7.00
7.01							7.01
7.02							7.02
7.03							7.03
7.04							7.04
7.05							7.05
7.06							7.06
7.07							7.07
7.08							7.08
7.09							7.09
7.10							7.10
7.11							7.11
7.12							7.12
7.13							7.13
7.14							7.14
7.15							7.15
7.16							7.16
7.17							7.17
7.18							7.18
7.19							7.19
7.20							7.20
7.21							7.21
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7.23							7.23
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7.41							7.41
7.42							7.42
7.43							7.43
7.44							7.44
7.45							7.45
7.46							7.46
7.47							7.47
7.48							7.48
7.49							7.49

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
7.00	.999999	.999997	.999994	.999990	.999982	.999972	7.00
7.01	.999999	.999997	.999995	.999990	.999983	.999972	7.01
7.02	.999999	.999997	.999995	.999990	.999983	.999973	7.02
7.03	.999999	.999997	.999995	.999990	.999983	.999973	7.03
7.04	.999999	.999998	.999995	.999990	.999984	.999974	7.04
7.05	.999999	.999998	.999995	.999991	.999984	.999974	7.05
7.06	.999999	.999998	.999995	.999991	.999984	.999975	7.06
7.07	.999999	.999998	.999995	.999991	.999984	.999975	7.07
7.08	.999999	.999998	.999995	.999991	.999985	.999975	7.08
7.09	.999999	.999998	.999995	.999991	.999985	.999976	7.09
7.10	.999999	.999998	.999995	.999991	.999985	.999976	7.10
7.11	.999999	.999998	.999996	.999992	.999985	.999976	7.11
7.12	.999999	.999998	.999996	.999992	.999986	.999977	7.12
7.13	.999999	.999998	.999996	.999992	.999986	.999977	7.13
7.14	.999999	.999998	.999996	.999992	.999986	.999978	7.14
7.15	.999999	.999998	.999996	.999992	.999986	.999978	7.15
7.16	.999999	.999998	.999996	.999992	.999987	.999978	7.16
7.17	.999999	.999998	.999996	.999992	.999987	.999979	7.17
7.18	.999999	.999998	.999996	.999993	.999987	.999979	7.18
7.19	.999999	.999998	.999996	.999993	.999987	.999979	7.19
7.20	.999999	.999998	.999996	.999993	.999987	.999980	7.20
7.21	.999999	.999998	.999996	.999993	.999988	.999980	7.21
7.22	.999999	.999998	.999996	.999993	.999988	.999980	7.22
7.23	.999999	.999998	.999996	.999993	.999988	.999981	7.23
7.24	.999999	.999998	.999997	.999993	.999988	.999981	7.24
7.25	.999999	.999998	.999997	.999993	.999988	.999981	7.25
7.26	.999999	.999998	.999997	.999994	.999989	.999981	7.26
7.27	.999999	.999999	.999997	.999994	.999989	.999982	7.27
7.28	.999999	.999999	.999997	.999994	.999989	.999982	7.28
7.29	.999999	.999999	.999997	.999994	.999989	.999982	7.29
7.30	.999999	.999999	.999997	.999994	.999989	.999983	7.30
7.31	.999999	.999999	.999997	.999994	.999990	.999983	7.31
7.32	.999999	.999999	.999997	.999994	.999990	.999983	7.32
7.33	.999999	.999999	.999997	.999994	.999990	.999983	7.33
7.34		.999999	.999997	.999994	.999990	.999984	7.34
7.35		.999999	.999997	.999995	.999990	.999984	7.35
7.36		.999999	.999997	.999995	.999990	.999984	7.36
7.37		.999999	.999997	.999995	.999991	.999984	7.37
7.38		.999999	.999997	.999995	.999991	.999985	7.38
7.39		.999999	.999997	.999995	.999991	.999985	7.39
7.40		.999999	.999997	.999995	.999991	.999985	7.40
7.41		.999999	.999998	.999995	.999991	.999985	7.41
7.42		.999999	.999998	.999995	.999991	.999986	7.42
7.43		.999999	.999998	.999995	.999992	.999986	7.43
7.44		.999999	.999998	.999995	.999992	.999986	7.44
7.45		.999999	.999998	.999995	.999992	.999986	7.45
7.46		.999999	.999998	.999996	.999992	.999986	7.46
7.47		.999999	.999998	.999996	.999992	.999987	7.47
7.48		.999999	.999998	.999996	.999992	.999987	7.48
7.49		.999999	.999998	.999996	.999992	.999987	7.49

t	SKEWNESS .0	.1	.2	.3	.4	.5	t
7.50							7.50
7.51							7.51
7.52							7.52
7.53							7.53
7.54							7.54
7.55							7.55
7.56							7.56
7.57							7.57
7.58							7.58
7.59							7.59
7.60							7.60
7.61							7.61
7.62							7.62
7.63							7.63
7.64							7.64
7.65							7.65
7.66							7.66
7.67							7.67
7.68							7.68
7.69							7.69
7.70							7.70
7.71							7.71
7.72							7.72
7.73							7.73
7.74							7.74
7.75							7.75
7.76							7.76
7.77							7.77
7.78							7.78
7.79							7.79
7.80							7.80
7.81							7.81
7.82							7.82
7.83							7.83
7.84							7.84
7.85							7.85
7.86							7.86
7.87							7.87
7.88							7.88
7.89							7.89
7.90							7.90
7.91							7.91
7.92							7.92
7.93							7.93
7.94							7.94
7.95							7.95
7.96							7.96
7.97							7.97
7.98							7.98
7.99							7.99

t	SKEWNESS .6	.7	.8	.9	1.0	1.1	t
7.50		.999999	.999998	.999996	.999992	.999987	7.50
7.51		.999999	.999998	.999996	.999993	.999987	7.51
7.52		.999999	.999998	.999996	.999993	.999988	7.52
7.53		.999999	.999998	.999996	.999993	.999988	7.53
7.54		.999999	.999998	.999996	.999993	.999988	7.54
7.55		.999999	.999998	.999996	.999993	.999988	7.55
7.56		.999999	.999998	.999996	.999993	.999988	7.56
7.57		.999999	.999998	.999996	.999993	.999989	7.57
7.58		.999999	.999998	.999996	.999993	.999989	7.58
7.59		.999999	.999998	.999997	.999994	.999989	7.59
7.60		.999999	.999998	.999997	.999994	.999989	7.60
7.61		.999999	.999998	.999997	.999994	.999989	7.61
7.62		.999999	.999998	.999997	.999994	.999989	7.62
7.63		.999999	.999998	.999997	.999994	.999990	7.63
7.64		.999999	.999998	.999997	.999994	.999990	7.64
7.65		.999999	.999998	.999997	.999994	.999990	7.65
7.66		.999999	.999999	.999997	.999994	.999990	7.66
7.67		.999999	.999999	.999997	.999994	.999990	7.67
7.68		.999999	.999999	.999997	.999994	.999990	7.68
7.69		.999999	.999999	.999997	.999995	.999991	7.69
7.70		.999999	.999999	.999997	.999995	.999991	7.70
7.71		.999999	.999999	.999997	.999995	.999991	7.71
7.72		.999999	.999999	.999997	.999995	.999991	7.72
7.73		.999999	.999999	.999997	.999995	.999991	7.73
7.74		.999999	.999999	.999997	.999995	.999991	7.74
7.75		.999999	.999999	.999997	.999995	.999991	7.75
7.76		.999999	.999999	.999997	.999995	.999992	7.76
7.77			.999999	.999997	.999995	.999992	7.77
7.78			.999999	.999998	.999995	.999992	7.78
7.79			.999999	.999998	.999995	.999992	7.79
7.80			.999999	.999998	.999995	.999992	7.80
7.81			.999999	.999998	.999996	.999992	7.81
7.82			.999999	.999998	.999996	.999992	7.82
7.83			.999999	.999998	.999996	.999992	7.83
7.84			.999999	.999998	.999996	.999993	7.84
7.85			.999999	.999998	.999996	.999993	7.85
7.86			.999999	.999998	.999996	.999993	7.86
7.87			.999999	.999998	.999996	.999993	7.87
7.88			.999999	.999998	.999996	.999993	7.88
7.89			.999999	.999998	.999996	.999993	7.89
7.90			.999999	.999998	.999996	.999993	7.90
7.91			.999999	.999998	.999996	.999993	7.91
7.92			.999999	.999998	.999996	.999993	7.92
7.93			.999999	.999998	.999996	.999994	7.93
7.94			.999999	.999998	.999996	.999994	7.94
7.95			.999999	.999998	.999997	.999994	7.95
7.96			.999999	.999998	.999997	.999994	7.96
7.97			.999999	.999998	.999997	.999994	7.97
7.98			.999999	.999998	.999997	.999994	7.98
7.99			.999999	.999998	.999997	.999994	7.99

t	SKEWNESS						t
	.0	.1	.2	.3	.4	.5	
8.00							8.00
8.01							8.01
8.02							8.02
8.03							8.03
8.04							8.04
8.05							8.05
8.06							8.06
8.07							8.07
8.08							8.08
8.09							8.09
8.10							8.10
8.11							8.11
8.12							8.12
8.13							8.13
8.14							8.14
8.15							8.15
8.16							8.16
8.17							8.17
8.18							8.18
8.19							8.19
8.20							8.20
8.21							8.21
8.22							8.22
8.23							8.23
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8.33							8.33
8.34							8.34
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8.36							8.36
8.37							8.37
8.38							8.38
8.39							8.39
8.40							8.40
8.41							8.41
8.42							8.42
8.43							8.43
8.44							8.44
8.45							8.45
8.46							8.46
8.47							8.47
8.48							8.48
8.49							8.49

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
8.00			.999999	.999998	.999997	.999994	8.00
8.01			.999999	.999998	.999997	.999994	8.01
8.02			.999999	.999998	.999997	.999994	8.02
8.03			.999999	.999998	.999997	.999995	8.03
8.04			.999999	.999998	.999997	.999995	8.04
8.05			.999999	.999999	.999997	.999995	8.05
8.06			.999999	.999999	.999997	.999995	8.06
8.07			.999999	.999999	.999997	.999995	8.07
8.08			.999999	.999999	.999997	.999995	8.08
8.09			.999999	.999999	.999997	.999995	8.09
8.10			.999999	.999999	.999997	.999995	8.10
8.11			.999999	.999999	.999997	.999995	8.11
8.12			.999999	.999999	.999997	.999995	8.12
8.13			.999999	.999999	.999997	.999995	8.13
8.14			.999999	.999999	.999997	.999995	8.14
8.15			.999999	.999999	.999998	.999995	8.15
8.16			.999999	.999999	.999998	.999996	8.16
8.17			.999999	.999999	.999998	.999996	8.17
8.18			.999999	.999999	.999998	.999996	8.18
8.19			.999999	.999999	.999998	.999996	8.19
8.20				.999999	.999998	.999996	8.20
8.21				.999999	.999998	.999996	8.21
8.22				.999999	.999998	.999996	8.22
8.23				.999999	.999998	.999996	8.23
8.24				.999999	.999998	.999996	8.24
8.25				.999999	.999998	.999996	8.25
8.26				.999999	.999998	.999996	8.26
8.27				.999999	.999998	.999996	8.27
8.28				.999999	.999998	.999996	8.28
8.29				.999999	.999998	.999996	8.29
8.30				.999999	.999998	.999996	8.30
8.31				.999999	.999998	.999997	8.31
8.32				.999999	.999998	.999997	8.32
8.33				.999999	.999998	.999997	8.33
8.34				.999999	.999998	.999997	8.34
8.35				.999999	.999998	.999997	8.35
8.36				.999999	.999998	.999997	8.36
8.37				.999999	.999998	.999997	8.37
8.38				.999999	.999998	.999997	8.38
8.39				.999999	.999998	.999997	8.39
8.40				.999999	.999998	.999997	8.40
8.41				.999999	.999998	.999997	8.41
8.42				.999999	.999998	.999997	8.42
8.43				.999999	.999998	.999997	8.43
8.44				.999999	.999999	.999997	8.44
8.45				.999999	.999999	.999997	8.45
8.46				.999999	.999999	.999997	8.46
8.47				.999999	.999999	.999997	8.47
8.48				.999999	.999999	.999997	8.48
8.49				.999999	.999999	.999997	8.49

t	SKEWNESS .0	.1	.2	.3	.4	.5	t
8.50							8.50
8.51							8.51
8.52							8.52
8.53							8.53
8.54							8.54
8.55							8.55
8.56							8.56
8.57							8.57
8.58							8.58
8.59							8.59
8.60							8.60
8.61							8.61
8.62							8.62
8.63							8.63
8.64							8.64
8.65							8.65
8.66							8.66
8.67							8.67
8.68							8.68
8.69							8.69
8.70							8.70
8.71							8.71
8.72							8.72
8.73							8.73
8.74							8.74
8.75							8.75
8.76							8.76
8.77							8.77
8.78							8.78
8.79							8.79
8.80							8.80
8.81							8.81
8.82							8.82
8.83							8.83
8.84							8.84
8.85							8.85
8.86							8.86
8.87							8.87
8.88							8.88
8.89							8.89
8.90							8.90
8.91							8.91
8.92							8.92
8.93							8.93
8.94							8.94
8.95							8.95
8.96							8.96
8.97							8.97
8.98							8.98
8.99							8.99

t	SKEWNESS .6	.7	.8	.9	1.0	1.1	t
8.50				.999999	.999999	.999997	8.50
8.51				.999999	.999999	.999997	8.51
8.52				.999999	.999999	.999998	8.52
8.53				.999999	.999999	.999998	8.53
8.54				.999999	.999999	.999998	8.54
8.55				.999999	.999999	.999998	8.55
8.56				.999999	.999999	.999998	8.56
8.57				.999999	.999999	.999998	8.57
8.58				.999999	.999999	.999998	8.58
8.59				.999999	.999999	.999998	8.59
8.60				.999999	.999999	.999998	8.60
8.61				.999999	.999999	.999998	8.61
8.62				.999999	.999999	.999998	8.62
8.63				.999999	.999999	.999998	8.63
8.64					.999999	.999998	8.64
8.65					.999999	.999998	8.65
8.66					.999999	.999998	8.66
8.67					.999999	.999998	8.67
8.68					.999999	.999998	8.68
8.69					.999999	.999998	8.69
8.70					.999999	.999998	8.70
8.71					.999999	.999998	8.71
8.72					.999999	.999998	8.72
8.73					.999999	.999998	8.73
8.74					.999999	.999998	8.74
8.75					.999999	.999998	8.75
8.76					.999999	.999998	8.76
8.77					.999999	.999998	8.77
8.78					.999999	.999998	8.78
8.79					.999999	.999998	8.79
8.80					.999999	.999998	8.80
8.81					.999999	.999998	8.81
8.82					.999999	.999998	8.82
8.83					.999999	.999998	8.83
8.84					.999999	.999999	8.84
8.85					.999999	.999999	8.85
8.86					.999999	.999999	8.86
8.87					.999999	.999999	8.87
8.88					.999999	.999999	8.88
8.89					.999999	.999999	8.89
8.90					.999999	.999999	8.90
8.91					.999999	.999999	8.91
8.92					.999999	.999999	8.92
8.93					.999999	.999999	8.93
8.94					.999999	.999999	8.94
8.95					.999999	.999999	8.95
8.96					.999999	.999999	8.96
8.97					.999999	.999999	8.97
8.98					.999999	.999999	8.98
8.99					.999999	.999999	8.99

t	SKEWNESS						t
	.0	.1	.2	.3	.4	.5	
9.00							9.00
9.01							9.01
9.02							9.02
9.03							9.03
9.04							9.04
9.05							9.05
9.06							9.06
9.07							9.07
9.08							9.08
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9.21							9.21
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9.26							9.26
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9.38							9.38
9.39							9.39
9.40							9.40
9.41							9.41
9.42							9.42
9.43							9.43
9.44							9.44
9.45							9.45
9.46							9.46
9.47							9.47
9.48							9.48
9.49							9.49

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
9.00					.999999	.999999	9.00
9.01					.999999	.999999	9.01
9.02					.999999	.999999	9.02
9.03					.999999	.999999	9.03
9.04					.999999	.999999	9.04
9.05					.999999	.999999	9.05
9.06					.999999	.999999	9.06
9.07					.999999	.999999	9.07
9.08						.999999	9.08
9.09						.999999	9.09
9.10						.999999	9.10
9.11						.999999	9.11
9.12						.999999	9.12
9.13						.999999	9.13
9.14						.999999	9.14
9.15						.999999	9.15
9.16						.999999	9.16
9.17						.999999	9.17
9.18						.999999	9.18
9.19						.999999	9.19
9.20						.999999	9.20
9.21						.999999	9.21
9.22						.999999	9.22
9.23						.999999	9.23
9.24						.999999	9.24
9.25						.999999	9.25
9.26						.999999	9.26
9.27						.999999	9.27
9.28						.999999	9.28
9.29						.999999	9.29
9.30						.999999	9.30
9.31						.999999	9.31
9.32						.999999	9.32
9.33						.999999	9.33
9.34						.999999	9.34
9.35						.999999	9.35
9.36						.999999	9.36
9.37						.999999	9.37
9.38						.999999	9.38
9.39						.999999	9.39
9.40						.999999	9.40
9.41						.999999	9.41
9.42						.999999	9.42
9.43						.999999	9.43
9.44						.999999	9.44
9.45						.999999	9.45
9.46						.999999	9.46
9.47						.999999	9.47
9.48						.999999	9.48
9.49						.999999	9.49

t	SKEWNESS .0	.1	.2	.3	.4	.5	t
9.50							9.50
9.51							9.51
9.52							9.52
9.53							9.53
9.54							9.54
9.55							9.55
9.56							9.56
9.57							9.57
9.58							9.58
9.59							9.59
9.60							9.60
9.61							9.61
9.62							9.62
9.63							9.63
9.64							9.64
9.65							9.65
9.66							9.66
9.67							9.67
9.68							9.68
9.69							9.69
9.70							9.70
9.71							9.71
9.72							9.72
9.73							9.73
9.74							9.74
9.75							9.75
9.76							9.76
9.77							9.77
9.78							9.78
9.79							9.79
9.80							9.80
9.81							9.81
9.82							9.82
9.83							9.83
9.84							9.84
9.85							9.85
9.86							9.86
9.87							9.87
9.88							9.88
9.89							9.89
9.90							9.90
9.91							9.91
9.92							9.92
9.93							9.93
9.94							9.94
9.95							9.95
9.96							9.96
9.97							9.97
9.98							9.98
9.99							9.99

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
9.50						.999999	9.50
9.51						.999999	9.51
9.52							9.52
9.53							9.53
9.54							9.54
9.55							9.55
9.56							9.56
9.57							9.57
9.58							9.58
9.59							9.59
9.60							9.60
9.61							9.61
9.62							9.62
9.63							9.63
9.64							9.64
9.65							9.65
9.66							9.66
9.67							9.67
9.68							9.68
9.69							9.69
9.70							9.70
9.71							9.71
9.72							9.72
9.73							9.73
9.74							9.74
9.75							9.75
9.76							9.76
9.77							9.77
9.78							9.78
9.79							9.79
9.80							9.80
9.81							9.81
9.82							9.82
9.83							9.83
9.84							9.84
9.85							9.85
9.86							9.86
9.87							9.87
9.88							9.88
9.89							9.89
9.90							9.90
9.91							9.91
9.92							9.92
9.93							9.93
9.94							9.94
9.95							9.95
9.96							9.96
9.97							9.97
9.98							9.98
9.99							9.99

TABLE II

ORDINATES OF THE STANDARDIZED TYPE III FUNCTION

$$y = y_o \left(1 + \frac{\alpha_3}{2} t\right)^{\frac{4}{\alpha_3^2} - 1} e^{-\frac{2}{\alpha_3} t}$$

t	SKEWNESS						t
	.0	.1	.2	.3	.4	.5	
-5.49							-5.49
-5.48							-5.48
-5.47							-5.47
-5.46							-5.46
-5.45							-5.45
-5.44							-5.44
-5.43							-5.43
-5.42							-5.42
-5.41							-5.41
-5.40							-5.40
-5.39							-5.39
-5.38							-5.38
-5.37							-5.37
-5.36							-5.36
-5.35							-5.35
-5.34							-5.34
-5.33							-5.33
-5.32							-5.32
-5.31							-5.31
-5.30							-5.30
-5.29							-5.29
-5.28							-5.28
-5.27							-5.27
-5.26							-5.26
-5.25							-5.25
-5.24							-5.24
-5.23							-5.23
-5.22							-5.22
-5.21	.000001						-5.21
-5.20	.000001						-5.20
-5.19	.000001						-5.19
-5.18	.000001						-5.18
-5.17	.000001						-5.17
-5.16	.000001						-5.16
-5.15	.000001						-5.15
-5.14	.000001						-5.14
-5.13	.000001						-5.13
-5.12	.000001						-5.12
-5.11	.000001						-5.11
-5.10	.000001						-5.10
-5.09	.000001						-5.09
-5.08	.000001						-5.08
-5.07	.000001						-5.07
-5.06	.000001						-5.06
-5.05	.000001						-5.05
-5.04	.000001						-5.04
-5.03	.000001						-5.03
-5.02	.000001						-5.02
-5.01	.000001						-5.01
-5.00	.000001						-5.00

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
-5.49							-5.49
-5.48							-5.48
-5.47							-5.47
-5.46							-5.46
-5.45							-5.45
-5.44							-5.44
-5.43							-5.43
-5.42							-5.42
-5.41							-5.41
-5.40							-5.40
-5.39							-5.39
-5.38							-5.38
-5.37							-5.37
-5.36							-5.36
-5.35							-5.35
-5.34							-5.34
-5.33							-5.33
-5.32							-5.32
-5.31							-5.31
-5.30							-5.30
-5.29							-5.29
-5.28							-5.28
-5.27							-5.27
-5.26							-5.26
-5.25							-5.25
-5.24							-5.24
-5.23							-5.23
-5.22							-5.22
-5.21							-5.21
-5.20							-5.20
-5.19							-5.19
-5.18							-5.18
-5.17							-5.17
-5.16							-5.16
-5.15							-5.15
-5.14							-5.14
-5.13							-5.13
-5.12							-5.12
-5.11							-5.11
-5.10							-5.10
-5.09							-5.09
-5.08							-5.08
-5.07							-5.07
-5.06							-5.06
-5.05							-5.05
-5.04							-5.04
-5.03							-5.03
-5.02							-5.02
-5.01							-5.01
-5.00							-5.00

t	SKEWNESS						t
	.0	.1	.2	.3	.4	.5	
−4.99	.000002						−4.99
−4.98	.000002						−4.98
−4.97	.000002						−4.97
−4.96	.000002						−4.96
−4.95	.000002						−4.95
−4.94	.000002						−4.94
−4.93	.000002						−4.93
−4.92	.000002						−4.92
−4.91	.000002						−4.91
−4.90	.000002						−4.90
−4.89	.000003						−4.89
−4.88	.000003						−4.88
−4.87	.000003						−4.87
−4.86	.000003						−4.86
−4.85	.000003						−4.85
−4.84	.000003						−4.84
−4.83	.000003						−4.83
−4.82	.000004						−4.82
−4.81	.000004	000001					−4.81
−4.80	.000004	000001					−4.80
−4.79	.000004	000001					−4.79
−4.78	.000004	000001					−4.78
−4.77	.000005	000001					−4.77
−4.76	.000005	000001					−4.76
−4.75	.000005	000001					−4.75
−4.74	.000005	000001					−4.74
−4.73	000006	000001					−4.73
−4.72	000006	000001					−4.72
−4.71	000006	000001					−4.71
−4.70	000006	000001					−4.70
−4.69	000007	000001					−4.69
−4.68	000007	000001					−4.68
−4.67	000007	000001					−4.67
−4.66	000008	000001					−4.66
−4.65	000008	000001					−4.65
−4.64	000008	000001					−4.64
−4.63	000009	000002					−4.63
−4.62	000009	000002					−4.62
−4.61	000010	000002					−4.61
−4.60	000010	000002					−4.60
−4.59	000011	000002					−4.59
−4.58	000011	000002					−4.58
−4.57	000012	000002					−4.57
−4.56	000012	000002					−4.56
−4.55	000013	000002					−4.55
−4.54	000013	000003					−4.54
−4.53	000014	000003					−4.53
−4.52	000015	000003					−4.52
−4.51	000015	000003					−4.51
−4.50	000016	000003					−4.50

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
-4.99							-4.99
-4.98							-4.98
-4.97							-4.97
-4.96							-4.96
-4.95							-4.95
-4.94							-4.94
-4.93							-4.93
-4.92							-4.92
-4.91							-4.91
-4.90							-4.90
-4.89							-4.89
-4.88							-4.88
-4.87							-4.87
-4.86							-4.86
-4.85							-4.85
-4.84							-4.84
-4.83							-4.83
-4.82							-4.82
-4.81							-4.81
-4.80							-4.80
-4.79							-4.79
-4.78							-4.78
-4.77							-4.77
-4.76							-4.76
-4.75							-4.75
-4.74							-4.74
-4.73							-4.73
-4.72							-4.72
-4.71							-4.71
-4.70							-4.70
-4.69							-4.69
-4.68							-4.68
-4.67							-4.67
-4.66							-4.66
-4.65							-4.65
-4.64							-4.64
-4.63							-4.63
-4.62							-4.62
-4.61							-4.61
-4.60							-4.60
-4.59							-4.59
-4.58							-4.58
-4.57							-4.57
-4.56							-4.56
-4.55							-4.55
-4.54							-4.54
-4.53							-4.53
-4.52							-4.52
-4.51							-4.51
-4.50							-4.50

t	SKEWNESS						t
	.0	.1	.2	.3	.4	.5	
−4.49	.000017	.000003					−4.49
−4.48	.000018	.000004					−4.48
−4.47	.000018	.000004					−4.47
−4.46	.000019	.000004					−4.46
−4.45	.000020	.000004					−4.45
−4.44	.000021	.000005					−4.44
−4.43	.000022	.000005					−4.43
−4.42	.000023	.000005	.000001				−4.42
−4.41	.000024	.000005	.000001				−4.41
−4.40	.000025	.000006	.000001				−4.40
−4.39	.000026	.000006	.000001				−4.39
−4.38	.000027	.000006	.000001				−4.38
−4.37	.000028	.000007	.000001				−4.37
−4.36	.000030	.000007	.000001				−4.36
−4.35	.000031	.000008	.000001				−4.35
−4.34	.000032	.000008	.000001				−4.34
−4.33	.000034	.000009	.000001				−4.33
−4.32	.000035	.000009	.000001				−4.32
−4.31	.000037	.000010	.000001				−4.31
−4.30	.000039	.000010	.000001				−4.30
−4.29	.000040	.000011	.000001				−4.29
−4.28	.000042	.000011	.000001				−4.28
−4.27	.000044	.000012	.000002				−4.27
−4.26	.000046	.000012	.000002				−4.26
−4.25	.000048	.000013	.000002				−4.25
−4.24	.000050	.000014	.000002				−4.24
−4.23	.000052	.000015	.000002				−4.23
−4.22	.000054	.000015	.000002				−4.22
−4.21	.000057	.000016	.000002				−4.21
−4.20	.000059	.000017	.000003				−4.20
−4.19	.000062	.000018	.000003				−4.19
−4.18	.000064	.000019	.000003				−4.18
−4.17	.000067	.000020	.000003				−4.17
−4.16	.000070	.000021	.000003				−4.16
−4.15	.000073	.000022	.000004				−4.15
−4.14	.000076	.000023	.000004				−4.14
−4.13	.000079	.000025	.000004				−4.13
−4.12	.000082	.000026	.000005				−4.12
−4.11	.000086	.000027	.000005				−4.11
−4.10	.000089	.000029	.000005				−4.10
−4.09	.000093	.000030	.000006				−4.09
−4.08	.000097	.000032	.000006				−4.08
−4.07	.000101	.000034	.000006				−4.07
−4.06	.000105	.000035	.000007				−4.06
−4.05	.000109	.000037	.000007				−4.05
−4.04	.000114	.000039	.000008	.000001			−4.04
−4.03	.000119	.000041	.000008	.000001			−4.03
−4.02	.000124	.000043	.000009	.000001			−4.02
−4.01	.000129	.000045	.000010	.000001			−4.01
−4.00	.000134	.000048	.000010	.000001			−4.00

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
−4.49							−4.49
−4.48							−4.48
−4.47							−4.47
−4.46							−4.46
−4.45							−4.45
−4.44							−4.44
−4.43							−4.43
−4.42							−4.42
−4.41							−4.41
−4.40							−4.40
−4.39							−4.39
−4.38							−4.38
−4.37							−4.37
−4.36							−4.36
−4.35							−4.35
−4.34							−4.34
−4.33							−4.33
−4.32							−4.32
−4.31							−4.31
−4.30							−4.30
−4.29							−4.29
−4.28							−4.28
−4.27							−4.27
−4.26							−4.26
−4.25							−4.25
−4.24							−4.24
−4.23							−4.23
−4.22							−4.22
−4.21							−4.21
−4.20							−4.20
−4.19							−4.19
−4.18							−4.18
−4.17							−4.17
−4.16							−4.16
−4.15							−4.15
−4.14							−4.14
−4.13							−4.13
−4.12							−4.12
−4.11							−4.11
−4.10							−4.10
−4.09							−4.09
−4.08							−4.08
−4.07							−4.07
−4.06							−4.06
−4.05							−4.05
−4.04							−4.04
−4.03							−4.03
−4.02							−4.02
−4.01							−4.01
−4.00							−4.00

t	SKEWNESS .0	.1	.2	.3	.4	.5	t
-3.99	.000139	.000050	.000011	.000001			-3.99
-3.98	.000144	.000052	.000012	.000001			-3.98
-3.97	.000151	.000055	.000012	.000001			-3.97
-3.96	.000157	.000058	.000013	.000001			-3.96
-3.95	.000163	.000061	.000014	.000001			-3.95
-3.94	.000170	.000064	.000015	.000001			-3.94
-3.93	.000177	.000067	.000016	.000002			-3.93
-3.92	.000184	.000070	.000017	.000002			-3.92
-3.91	.000191	.000074	.000018	.000002			-3.91
-3.90	.000199	.000077	.000019	.000002			-3.90
-3.89	.000207	.000081	.000021	.000002			-3.89
-3.88	.000215	.000085	.000022	.000002			-3.88
-3.87	.000223	.000089	.000023	.000003			-3.87
-3.86	.000232	.000094	.000025	.000003			-3.86
-3.85	.000241	.000098	.000026	.000003			-3.85
-3.84	.000251	.000103	.000028	.000003			-3.84
-3.83	.000260	.000108	.000030	.000004			-3.83
-3.82	.000271	.000113	.000032	.000004			-3.82
-3.81	.000281	.000118	.000033	.000004			-3.81
-3.80	.000292	.000124	.000036	.000005			-3.80
-3.79	.000303	.000130	.000038	.000005			-3.79
-3.78	.000315	.000136	.000040	.000006			-3.78
-3.77	.000327	.000142	.000042	.000006			-3.77
-3.76	.000340	.000149	.000045	.000007			-3.76
-3.75	.000353	.000156	.000048	.000007			-3.75
-3.74	.000366	.000163	.000051	.000008			-3.74
-3.73	.000380	.000171	.000054	.000009			-3.73
-3.72	.000394	.000178	.000057	.000009			-3.72
-3.71	.000409	.000187	.000060	.000010			-3.71
-3.70	.000425	.000195	.000064	.000011			-3.70
-3.69	.000441	.000204	.000067	.000012			-3.69
-3.68	.000457	.000213	.000071	.000013	.000001		-3.68
-3.67	.000474	.000223	.000076	.000014	.000001		-3.67
-3.66	.000492	.000233	.000080	.000015	.000001		-3.66
-3.65	.000510	.000244	.000085	.000016	.000001		-3.65
-3.64	.000529	.000255	.000089	.000017	.000001		-3.64
-3.63	.000549	.000266	.000094	.000019	.000001		-3.63
-3.62	.000569	.000278	.000100	.000020	.000001		-3.62
-3.61	.000590	.000290	.000105	.000022	.000001		-3.61
-3.60	.000612	.000303	.000111	.000024	.000001		-3.60
-3.59	.000634	.000317	.000118	.000025	.000002		-3.59
-3.58	.999657	.000331	.000124	.000027	.000002		-3.58
-3.57	.000681	.000345	.000131	.000029	.000002		-3.57
-3.56	.000706	.000360	.000138	.000032	.000002		-3.56
-3.55	.000732	.000376	.000146	.000034	.000003		-3.55
-3.54	.000758	.000392	.000154	.000037	.000003		-3.54
-3.53	.000785	.000409	.000162	.000039	.000003		-3.53
-3.52	.000814	.000427	.000171	.000042	.000004		-3.52
-3.51	.000843	.000445	.000181	.000045	.000004		-3.51
-3.50	.000873	.000464	.000190	.000049	.000004		-3.50

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
-3.99							-3.99
-3.98							-3.98
-3.97							-3.97
-3.96							-3.96
-3.95							-3.95
-3.94							-3.94
-3.93							-3.93
-3.92							-3.92
-3.91							-3.91
-3.90							-3.90
-3.89							-3.89
-3.88							-3.88
-3.87							-3.87
-3.86							-3.86
-3.85							-3.85
-3.84							-3.84
-3.83							-3.83
-3.82							-3.82
-3.81							-3.81
-3.80							-3.80
-3.79							-3.79
-3.78							-3.78
-3.77							-3.77
-3.76							-3.76
-3.75							-3.75
-3.74							-3.74
-3.73							-3.73
-3.72							-3.72
-3.71							-3.71
-3.70							-3.70
-3.69							-3.69
-3.68							-3.68
-3.67							-3.67
-3.66							-3.66
-3.65							-3.65
-3.64							-3.64
-3.63							-3.63
-3.62							-3.62
-3.61							-3.61
-3.60							-3.60
-3.59							-3.59
-3.58							-3.58
-3.57							-3.57
-3.56							-3.56
-3.55							-3.55
-3.54							-3.54
-3.53							-3.53
-3.52							-3.52
-3.51							-3.51
-3.50							-3.50

t	SKEWNESS .0	.1	.2	.3	.4	.5	t
−3.49	.000904	.000484	.000200	.000052	.000005		−3.49
−3.48	.000936	.000504	.000211	.000056	.000006		−3.48
−3.47	.000969	.000526	.000222	.000060	.000006		−3.47
−3.46	.001003	.000548	.000234	.000064	.000007		−3.46
−3.45	.001038	.000571	.000246	.000069	.000008		−3.45
−3.44	.001075	.000595	.000259	.000074	.000008		−3.44
−3.43	.001112	.000620	.000273	.000079	.000009		−3.43
−3.42	.001151	.000645	.000287	.000085	.000010		−3.42
−3.41	.001191	.000672	.000302	.000090	.000012		−3.41
−3.40	.001232	.000700	.000317	.000097	.000013		−3.40
−3.39	.001275	.000729	.000333	.000103	.000014		−3.39
−3.38	.001319	.000758	.000350	.000110	.000016		−3.38
−3.37	.001364	.000789	.000368	.000118	.000017		−3.37
−3.36	.001411	.000822	.000387	.000126	.000019		−3.36
−3.35	.001459	.000855	.000406	.000134	.000021		−3.35
−3.34	.001508	.000889	.000427	.000143	.000023		−3.34
−3.33	.001560	.000925	.000448	.000152	.000025	.000001	−3.33
−3.32	.001612	.000962	.000470	.000162	.000028	.000001	−3.32
−3.31	.001667	.001001	.000493	.000173	.000030	.000001	−3.31
−3.30	.001723	.001040	.000517	.000184	.000033	.000001	−3.30
−3.29	.001780	.001082	.000542	.000196	.000036	.000001	−3.29
−3.28	.001840	.001124	.000569	.000208	.000040	.000001	−3.28
−3.27	.001901	.001168	.000596	.000221	.000043	.000002	−3.27
−3.26	.001964	.001214	.000625	.000235	.000047	.000002	−3.26
−3.25	.002029	.001262	.000655	.000250	.000052	.000002	−3.25
−3.24	.002096	.001311	.000686	.000265	.000057	.000003	−3.24
−3.23	.002165	.001361	.000719	.000282	.000062	.000003	−3.23
−3.22	.002236	.001414	.000753	.000299	.000067	.000003	−3.22
−3.21	.002309	.001468	.000788	.000317	.000073	.000004	−3.21
−3.20	.002384	.001524	.000825	.000336	.000079	.000005	−3.20
−3.19	.002462	.001583	.000863	.000357	.000086	.000005	−3.19
−3.18	.002541	.001643	.000903	.000378	.000094	.000006	−3.18
−3.17	.002623	.001705	.000945	.000401	.000102	.000007	−3.17
−3.16	.002707	.001769	.000988	.000424	.000110	.000008	−3.16
−3.15	.002794	.001836	.001033	.000449	.000119	.000010	−3.15
−3.14	.002884	.001904	.001080	.000475	.000129	.000011	−3.14
−3.13	.002975	.001975	.001129	.000503	.000140	.000013	−3.13
−3.12	.003070	.002048	.001180	.000532	.000151	.000014	−3.12
−3.11	.003167	.002124	.001233	.000562	.000163	.000016	−3.11
−3.10	.003267	.002202	.001287	.000594	.000176	.000018	−3.10
−3.09	.003370	.002283	.001345	.000628	.000190	.000021	−3.09
−3.08	.003475	.002367	.001404	.000663	.000205	.000024	−3.08
−3.07	.003584	.002453	.001465	.000700	.000221	.000027	−3.07
−3.06	.003695	.002542	.001529	.000739	.000238	.000030	−3.06
−3.05	.003810	.002633	.001596	.000780	.000256	.000034	−3.05
−3.04	.003928	.002728	.001665	.000822	.000275	.000038	−3.04
−3.03	.004049	.002826	.001737	.000867	.000296	.000043	−3.03
−3.02	.004173	.002927	.001811	.000914	.000318	.000048	−3.02
−3.01	.004301	.003031	.001888	.000963	.000341	.000054	−3.01
−3.00	.004432	.003138	.001968	.001014	.000366	.000060	−3.00

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
-3.49							-3.49
-3.48							-3.48
-3.47							-3.47
-3.46							-3.46
-3.45							-3.45
-3.44							-3.44
-3.43							-3.43
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-3.41							-3.41
-3.40							-3.40
-3.39							-3.39
-3.38							-3.38
-3.37							-3.37
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-3.32							-3.32
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-3.24							-3.24
-3.23							-3.23
-3.22							-3.22
-3.21							-3.21
-3.20							-3.20
-3.19							-3.19
-3.18							-3.18
-3.17							-3.17
-3.16							-3.16
-3.15							-3.15
-3.14							-3.14
-3.13							-3.13
-3.12							-3.12
-3.11							-3.11
-3.10							-3.10
-3.09							-3.09
-3.08							-3.08
-3.07							-3.07
-3.06							-3.06
-3.05							-3.05
-3.04							-3.04
-3.03							-3.03
-3.02							-3.02
-3.01	.000001						-3.01
-3.00	.000001						-3.00

t	SKEWNESS						t
	.0	.1	.2	.3	.4	.5	
−2.99	.004567	.003248	.002051	.001068	.000392	.000067	−2.99
−2.98	.004705	.003363	.002137	.001124	.000420	.000075	−2.98
−2.97	.004847	.003480	.002227	.001183	.000450	.000083	−2.97
−2.96	.004993	.003601	.002319	.001245	.000482	.000092	−2.96
−2.95	.005143	.003726	.002415	.001309	.000515	.000102	−2.95
−2.94	.005296	.003855	.002515	.001376	.000551	.000113	−2.94
−2.93	.005454	.003987	.002618	.001447	.000589	.000125	−2.93
−2.92	.005616	.004124	.002724	.001520	.000629	.000139	−2.92
−2.91	.005782	.004265	.002835	.001596	.000671	.000153	−2.91
−2.90	.005953	.004409	.002949	.001676	.000716	.000168	−2.90
−2.89	.006127	.004559	.003067	.001760	.000763	.000185	−2.89
−2.88	.006307	.004712	.003190	.001847	.000813	.000204	−2.88
−2.87	.006491	.004870	.003316	.001937	.000866	.000224	−2.87
−2.86	.006679	.005033	.003447	.002032	.000922	.000245	−2.86
−2.85	.006873	.005200	.003583	.002130	.000980	.000269	−2.85
−2.84	.007071	.005372	.003723	.002233	.001042	.000294	−2.84
−2.83	.007274	.005550	.003868	.002339	.001108	.000321	−2.83
−2.82	.007483	.005732	.004018	.002450	.001177	.000351	−2.82
−2.81	.007697	.005919	.004172	.002566	.001249	.000382	−2.81
−2.80	.007915	.006112	.004332	.002686	.001326	.000416	−2.80
−2.79	.008140	.006310	.004497	.002812	.001406	.000453	−2.79
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−2.75	.009094	.007160	.005213	.003364	.001771	.000629	−2.75
−2.74	.009347	.007387	.005407	.003516	.001873	.000681	−2.74
−2.73	.009606	.007620	.005607	.003673	.001981	.000737	−2.73
−2.72	.009871	.007860	.005813	.003837	.002094	.000796	−2.72
−2.71	.010143	.008106	.006025	.004006	.002213	.000860	−2.71
−2.70	.010421	.008359	.006244	.004182	.002337	.000927	−2.70
−2.69	.010706	.008618	.006470	.004365	.002467	.001000	−2.69
−2.68	.010997	.008885	.006703	.004554	.002603	.001076	−2.68
−2.67	.011295	.009158	.006942	.004750	.002745	.001158	−2.67
−2.66	.011600	.009439	.007189	.004953	.002894	.001245	−2.66
−2.65	.011912	.009726	.007444	.005164	.003049	.001337	−2.65
−2.64	.012232	.010022	.007706	.005382	.003212	.001435	−2.64
−2.63	.012558	.010324	.007976	.005608	.003382	.001539	−2.63
−2.62	.012892	.010635	.008254	.005842	.003559	.001649	−2.62
−2.61	.013234	.010954	.008540	.006083	.003743	.001766	−2.61
−2.60	.013583	.011280	.008834	.006333	.003936	.001889	−2.60
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−2.58	.014305	.011958	.009448	.006860	.004347	.002158	−2.58
−2.57	.014678	.012310	.009768	.007136	.004565	.002303	−2.57
−2.56	.015060	.012670	.010097	.007422	.004792	.002457	−2.56
−2.55	.015449	.013039	.010436	.007717	.005028	.002619	−2.55
−2.54	.015848	.013417	.010784	.008022	.005274	.002789	−2.54
−2.53	.016254	.013805	.011141	.008336	.005530	.002969	−2.53
−2.52	.016670	.014201	.011509	.008661	.005796	.003158	−2.52
−2.51	.017095	.014607	.011886	.008997	.006072	.003356	−2.51
−2.50	.017528	.015023	.012274	.009342	.006360	.003565	−2.50

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
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-2.98	.000001						-2.98
-2.97	.000001						-2.97
-2.96	.000002						-2.96
-2.95	.000002						-2.95
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-2.88	.000010						-2.88
-2.87	.000012						-2.87
-2.86	.000015						-2.86
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-2.83	.000025						-2.83
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-2.80	.000040						-2.80
-2.79	.000047						-2.79
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-2.77	.000063						-2.77
-2.76	.000073						-2.76
-2.75	.000084						-2.75
-2.74	.000097						-2.74
-2.73	.000111						-2.73
-2.72	.000126						-2.72
-2.71	.000144						-2.71
-2.70	.000164						-2.70
-2.69	.000185	.000001					-2.69
-2.68	.000210	.000002					-2.68
-2.67	.000236	.000003					-2.67
-2.66	.000266	.000004					-2.66
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-2.63	.000374	.000010					-2.63
-2.62	.000417	.000013					-2.62
-2.61	.000464	.000017					-2.61
-2.60	.000516	.000021					-2.60
-2.59	.000572	.000027					-2.59
-2.58	.000634	.000035					-2.58
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-2.55	.000851	.000066					-2.55
-2.54	.000936	.000081					-2.54
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-2.52	.001126	.000119					-2.52
-2.51	.001232	.000142					-2.51
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t	SKEWNESS						t
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−2.47	.018885	.016330	.013500	.010446	.007288	.004255	−2.47
−2.46	.019356	.016786	.013930	.010837	.007621	.004508	−2.46
−2.45	.019837	.017253	.014372	.011240	.007966	.004773	−2.45
−2.44	.020328	.017730	.014825	.011655	.008324	.005050	−2.44
−2.43	.020829	.018218	.015290	.012082	.008695	.005341	−2.43
−2.42	.021341	.018717	.015766	.012522	.009079	.005644	−2.42
−2.41	.021862	.019227	.016255	.012974	.009476	.005961	−2.41
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−2.39	.022937	.020282	.017269	.013919	.010313	.006637	−2.39
−2.38	.023491	.020827	.017795	.014412	.010753	.006998	−2.38
−2.37	.024056	.021384	.018334	.014919	.011208	.007374	−2.37
−2.36	.024631	.021953	.018886	.015440	.011678	.007765	−2.36
−2.35	.025218	.022534	.019451	.015976	.012163	.008173	−2.35
−2.34	.025817	.023127	.020030	.016526	.012664	.008597	−2.34
−2.33	.026426	.023733	.020623	.017091	.013182	.009039	−2.33
−2.32	.027048	.024352	.021230	.017672	.013716	.009498	−2.32
−2.31	.027682	.024984	.021850	.018267	.014267	.009975	−2.31
−2.30	.028327	.025629	.022486	.018879	.014835	.010471	−2.30
−2.29	.028985	.026287	.023135	.019507	.015421	.010986	−2.29
−2.28	.029655	.026959	.023800	.020151	.016025	.011520	−2.28
−2.27	.030337	.027644	.024480	.020812	.016647	.012074	−2.27
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−2.25	.031740	.029057	.025885	.022184	.017947	.013242	−2.25
−2.24	.032460	.029784	.026611	.022896	.018625	.013859	−2.24
−2.23	.033194	.030526	.027352	.023625	.019323	.014496	−2.23
−2.22	.033941	.031282	.028110	.024372	.020041	.015156	−2.22
−2.21	.034701	.032053	.028884	.025138	.020780	.015838	−2.21
−2.20	.035475	.032839	.029675	.025922	.021538	.016544	−2.20
−2.19	.036262	.033640	.030482	.026724	.022318	.017272	−2.19
−2.18	.037063	.034456	.031307	.027546	.023119	.018025	−2.18
−2.17	.037878	.035287	.032148	.028386	.023942	.018801	−2.17
−2.16	.038707	.036134	.033006	.029246	.024786	.019603	−2.16
−2.15	.039550	.036997	.033883	.030125	.025652	.020429	−2.15
−2.14	.040408	.037875	.034776	.031025	.026541	.021282	−2.14
−2.13	.041280	.038770	.035688	.031944	.027453	.022160	−2.13
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−2.07	.046823	.044481	.041542	.037894	.033416	.027994	−2.07
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−2.05	.048792	.046520	.043645	.040048	.035598	.030164	−2.05
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−2.03	.050824	.048628	.045825	.042290	.037881	.032450	−2.03
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t	SKEWNESS						t
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−2.48	.001601	.000237					−2.48
−2.47	.001742	.000277					−2.47
−2.46	.001893	.000324					−2.46
−2.45	.002055	.000376					−2.45
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−2.43	.002411	.000501	.000001				−2.43
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−2.41	.002814	.000656	.000004				−2.41
−2.40	.003035	.000747	.000007				−2.40
−2.39	.003270	.000848	.000012				−2.39
−2.38	.003518	.000959	.000018				−2.38
−2.37	.003781	.001081	.000027				−2.37
−2.36	.004060	.001215	.000038				−2.36
−2.35	.004355	.001362	.000054				−2.35
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−2.33	.004993	.001697	.000099				−2.33
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−2.31	.005703	.002093	.000169				−2.31
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−2.25	.008307	.003716	.000614				−2.25
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−2.22	.009908	.004818	.001032				−2.22
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−2.15	.014535	.008324	.002797	.000064			−2.15
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−2.10	.018696	.011771	.004975	.000457			−2.10
−2.09	.019622	.012566	.005524	.000609			−2.09
−2.08	.020580	.013400	.006114	.000793			−2.08
−2.07	.021570	.014271	.006747	.001014			−2.07
−2.06	.022595	.015182	.007425	.001274			−2.06
−2.05	.023653	.016133	.008148	.001577			−2.05
−2.04	.024745	.017124	.008919	.001926			−2.04
−2.03	.025872	.018157	.009739	.002325			−2.03
−2.02	.027035	.019231	.010608	.002777			−2.02
−2.01	.028233	.020349	.011529	.003284			−2.01
−2.00	.029467	.021510	.012503	.003851			−2.00

t	SKEWNESS						t
	.0	.1	.2	.3	.4	.5	
−1.99	.055079	.053057	.050423	.047043	.042757	.037383	−1.99
−1.98	.056183	.054209	.051623	.048288	.044042	.038693	−1.98
−1.97	.057304	.055379	.052843	.049557	.045353	.040034	−1.97
−1.96	.058441	.056568	.054084	.050849	.046691	.041407	−1.96
−1.95	.059595	.057775	.055346	.052164	.048056	.042811	−1.95
−1.94	.060765	.059001	.056628	.053503	.049448	.044247	−1.94
−1.93	.061952	.060245	.057931	.054866	.050868	.045715	−1.93
−1.92	.063157	.061508	.059255	.056252	.052315	.047215	−1.92
−1.91	.064378	.062790	.060601	.057663	.053790	.048748	−1.91
−1.90	.065616	.064090	.061967	.059097	.055292	.050313	−1.90
−1.89	.066871	.065410	.063355	.060556	.056822	.051910	−1.89
−1.88	.068144	.066749	.064764	.062038	.058380	.053540	−1.88
−1.87	.069433	.068107	.066194	.063545	.059965	.055203	−1.87
−1.86	.070740	.069484	.067646	.065076	.061579	.056899	−1.86
−1.85	.072065	.070880	.069119	.066632	.063221	.058628	−1.85
−1.84	.073407	.072295	.070614	.068212	.064891	.060390	−1.84
−1.83	.074766	.073730	.072131	.069817	.066588	.062184	−1.83
−1.82	.076143	.075184	.073669	.071446	.068315	.064012	−1.82
−1.81	.077538	.076658	.075229	.073099	.070069	.065872	−1.81
−1.80	.078950	.078151	.076810	.074777	.071851	.067766	−1.80
−1.79	.080380	.079664	.078414	.076479	.073661	.069692	−1.79
−1.78	.081828	.081196	.080039	.078206	.075500	.071651	−1.78
−1.77	.083293	.082748	.081685	.079957	.077366	.073642	−1.77
−1.76	.084776	.084319	.083354	.081733	.079260	.075666	−1.76
−1.75	.086277	.085910	.085044	.083533	.081182	.077723	−1.75
−1.74	.087796	.087520	.086755	.085358	.083132	.079811	−1.74
−1.73	.089333	.089150	.088489	.087206	.085109	.081932	−1.73
−1.72	.090887	.090799	.090244	.089079	.087114	.084085	−1.72
−1.71	.092459	.092468	.092020	.090976	.089146	.086269	−1.71
−1.70	.094049	.094156	.093818	.092897	.091205	.088485	−1.70
−1.69	.095657	.095864	.095637	.094841	.093292	.090732	−1.69
−1.68	.097282	.097591	.097478	.096810	.095405	.093009	−1.68
−1.67	.098925	.099337	.099339	.098802	.097545	.095318	−1.67
−1.66	.100586	.101102	.101222	.100817	.099711	.097657	−1.66
−1.65	.102265	.102887	.103126	.102856	.101903	.100025	−1.65
−1.64	.103961	.104691	.105051	.104918	.104121	.102424	−1.64
−1.63	.105675	.106514	.106996	.107002	.106365	.104851	−1.63
−1.62	.107406	.108355	.108962	.109110	.108635	.107308	−1.62
−1.61	.109155	.110216	.110949	.111240	.110929	.109793	−1.61
−1.60	.110921	.112095	.112956	.113392	.113248	.112306	−1.60
−1.59	.112704	.113993	.114983	.115567	.115592	.114846	−1.59
−1.58	.114505	.115909	.117030	.117763	.117960	.117414	−1.58
−1.57	.116323	.117844	.119097	.119981	.120352	.120009	−1.57
−1.56	.118157	.119797	.121184	.122220	.122767	.122629	−1.56
−1.55	.120009	.121768	.123290	.124480	.125205	.125275	−1.55
−1.54	.121878	.123757	.125415	.126761	.127666	.127947	−1.54
−1.53	.123763	125763	.127559	.129062	.130150	.130643	−1.53
−1.52	.125665	.127787	.129722	.131384	.132655	.133363	−1.52
−1.51	.127583	.129829	.131903	.133725	.135181	.136106	−1.51
−1.50	.129518	.131888	.134103	.136086	.137729	.138872	−1.50

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
−1.99	.030738	.022715	.013530	.004479	.000003		−1.99
−1.98	.032045	.023965	.014612	.005171	.000020		−1.98
−1.97	.033390	.025260	.015750	.005931	.000068		−1.97
−1.96	.034772	.026601	.016945	.006761	.000158		−1.96
−1.95	.036192	.027988	.018198	.007662	.000302		−1.95
−1.94	.037650	.029422	.019510	.008638	.000511		−1.94
−1.93	.039146	.030903	.020881	.009690	.000795		−1.93
−1.92	.040681	.032432	.022313	.010820	.001163		−1.92
−1.91	.042255	.034008	.023805	.012030	.001624		−1.91
−1.90	.043868	.035633	.025359	.013320	.002183		−1.90
−1.89	.045520	.037306	.026975	.014694	.002848		−1.89
−1.88	.047211	.039027	.028654	.016152	.003625		−1.88
−1.87	.048941	.040797	.030395	.017694	.004517		−1.87
−1.86	.050711	.042617	.032200	.019322	.005530		−1.86
−1.85	.052521	.044485	.034068	.021037	.006667		−1.85
−1.84	.054370	.046403	.036000	.022839	.007931		−1.84
−1.83	.056259	.048370	.037995	.024729	.009325		−1.83
−1.82	.058187	.050385	.040054	.026706	.010850		−1.82
−1.81	.060155	.052450	.042177	.028771	.012508	.000041	−1.81
−1.80	.062162	.054564	.044364	.030925	.014300	.000251	−1.80
−1.79	.064209	.056727	.046614	.033166	.016226	.000677	−1.79
−1.78	.066295	.058938	.048927	.035494	.018287	.001339	−1.78
−1.77	.068420	.061198	.051302	.037910	.020482	.002249	−1.77
−1.76	.070584	.063506	.053740	.040412	.022811	.003411	−1.76
−1.75	.072787	.065862	.056241	.043000	.025272	.004829	−1.75
−1.74	.075028	.068265	.058802	.045673	.027865	.006502	−1.74
−1.73	.077307	.070715	.061424	.048430	.030587	.008427	−1.73
−1.72	.079624	.073212	.064107	.051270	.033438	.010600	−1.72
−1.71	.081979	.075755	.066848	.054192	.036414	.013018	−1.71
−1.70	.084371	.078344	.069649	.057194	.039514	.015674	−1.70
−1.69	.086800	.080978	.072507	.060276	.042736	.018562	−1.69
−1.68	.089266	.083656	.075422	.063435	.046076	.021675	−1.68
−1.67	.091767	.086379	.078393	.066671	.049531	.025005	−1.67
−1.66	.094304	.089144	.081419	.069981	.053099	.028545	−1.66
−1.65	.096877	.091953	.084499	.073364	.056776	.032287	−1.65
−1.64	.099484	.094803	.087632	.076819	.060560	.036221	−1.64
−1.63	.102125	.097694	.090817	.080342	.064446	.040341	−1.63
−1.62	.104800	.100626	.094052	.083933	.068431	.044638	−1.62
−1.61	.107507	.103597	.097336	.087589	.072512	.049102	−1.61
−1.60	.110248	.106606	.100668	.091308	.076685	.053726	−1.60
−1.59	.113020	.109653	.104046	.095088	.080947	.058501	−1.59
−1.58	.115823	.112737	.107470	.098927	.085292	.063419	−1.58
−1.57	.118656	.115857	.110938	.102824	.089718	.068472	−1.57
−1.56	.121520	.119012	.114448	.106774	.094221	.073650	−1.56
−1.55	.124412	.122201	.117999	.110777	.098796	.078946	−1.55
−1.54	.127333	.125422	.121590	.114830	.103441	.084352	−1.54
−1.53	.130282	.128676	.125218	.118930	.108150	.089859	−1.53
−1.52	.133257	.131960	.128883	.123076	.112920	.095461	−1.52
−1.51	.136258	.135273	.132582	.127264	.117747	.101149	−1.51
−1.50	.139285	.138615	.136315	.131493	.122626	.106916	−1.50

t	SKEWNESS .0	.1	.2	.3	.4	.5	t
−1.49	.131468	.133964	.136321	.138466	.140297	.141661	−1.49
−1.48	.133435	.136057	.138556	.140865	.142885	.144471	−1.48
−1.47	.135418	.138166	.140809	.143282	.145492	.147302	−1.47
−1.46	.137417	.140292	.143079	.145718	.148119	.150153	−1.46
−1.45	.139431	.142434	.145366	.148171	.150764	.153024	−1.45
−1.44	.141460	.144592	.147670	.150641	.153427	.155914	−1.44
−1.43	.143505	.146765	.149989	.153128	.156108	.158822	−1.43
−1.42	.145564	.148954	.152325	.155631	.158806	.161747	−1.42
−1.41	.147639	.151158	.154676	.158636	.161520	.164690	−1.41
−1.40	.149727	.153377	.157043	.160686	.164249	.167648	−1.40
−1.39	.151831	.155611	.159424	.163235	.166994	.170621	−1.39
−1.38	.153948	.157859	.161820	.165800	.169754	.173609	−1.38
−1.37	.156080	.160121	164230	.168379	.172528	.176611	−1.37
−1.36	158225	.162397	.166653	.170971	.175315	.179626	−1.36
−1.35	.160383	.164686	.169090	.173576	.178114	.182653	−1.35
−1.34	.162555	.166989	.171540	.176194	.180926	.185691	−1.34
−1.33	164740	169304	.174002	.178825	.183750	.188740	−1.33
−1.32	.166937	.171632	.176477	.181466	.186584	.191799	−1.32
−1.31	.169147	.173971	.178963	.184119	.189428	.194866	−1.31
−1.30	.171369	.176323	.181461	.186782	.192282	.197941	−1.30
−1.29	.173602	.178686	.183969	.189455	.195144	.201024	−1.29
−1.28	.175847	.181060	.186487	.192138	.198015	.204113	−1.28
−1.27	.178104	.183444	.189016	.194829	.200893	.207207	−1.27
−1.26	.180371	.185839	.191554	.197529	.203777	.210306	−1.26
−1.25	.182649	.188244	.194100	.200236	.206668	.213408	−1.25
−1.24	.184937	.190658	.196656	.202951	.209564	.216514	−1.24
−1.23	.187235	.193081	.199219	.205671	.212464	.219621	−1.23
−1.22	.189543	.195513	.201789	.208398	.215368	.222729	−1.22
−1.21	.191860	.197953	.204367	.211130	.218276	.225838	−1.21
−1.20	.194186	.200401	.206951	.213866	.221185	.228946	−1.20
−1.19	.196520	.202857	.209540	.216607	.224096	.232052	−1.19
−1.18	.198863	.205319	.212135	.219350	.227008	.235155	−1.18
−1.17	.201214	.207788	.214735	.222097	.229919	.238256	−1.17
−1.16	.203571	.210262	.217339	.224845	.232830	.241352	−1.16
−1.15	.205936	.212743	.219947	.227595	.235740	.244442	−1.15
−1.14	.208308	.215228	.222558	.230346	.238647	.247527	−1.14
−1.13	.210686	.217718	.225172	.233097	.241551	.250604	−1.13
−1.12	.213069	.220212	.227788	.235847	.244452	.253674	−1.12
−1.11	.215458	.222710	.230405	.238596	.247347	.256734	−1.11
−1.10	.217852	.225211	.233023	.241343	.250238	.259785	−1.10
−1.09	.220251	.227715	.235641	.244087	.253122	.262825	−1.09
−1.08	.222653	.230220	.238259	.246828	.255999	.265854	−1.08
−1.07	225060	.232728	.240876	.249566	.258868	.268871	−1.07
−1.06	.227470	.235236	.243492	.252298	.261729	.271874	−1.06
−1.05	.229882	.237745	.246105	.255025	.264581	.274863	−1.05
−1.04	.232297	.240254	.248716	.257746	.267423	.277836	−1.04
−1.03	.234714	.242763	.251324	.260461	.270253	.280794	−1.03
−1.02	.237132	.245271	.253927	.263168	.273073	.283736	−1.02
−1.01	.239551	.247777	.256526	.265867	.275879	.286659	−1.01
−1.00	.241971	.250281	.259120	.268557	.278673	.289564	−1.00

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
−1.49	.142336	.141985	.140079	.135760	.127555	.112755	−1.49
−1.48	.145411	.145380	.143873	.140062	.132530	.118658	−1.48
−1.47	.148508	.148801	.147695	.144398	.137545	.124618	−1.47
−1.46	.151627	.152245	.151544	.148764	.142598	.130629	−1.46
−1.45	.154767	.155712	.155418	.153158	.147684	.136684	−1.45
−1.44	.157927	.159201	.159314	.157578	.152800	.142777	−1.44
−1.43	.161106	.162709	.163233	.162021	.157942	.148900	−1.43
−1.42	.164303	.166236	.167170	.166485	.163106	.155049	−1.42
−1.41	.167517	.169781	.171126	.170967	.168290	.161218	−1.41
−1.40	.170748	.173342	.175098	.175465	.173488	.167399	−1.40
−1.39	.173994	.176918	.179085	.179977	.178698	.173589	−1.39
−1.38	.177254	.180508	.183084	.184499	.183916	.179781	1.38
−1.37	.180527	.184110	.187094	.189030	.189138	.185970	−1.37
−1.36	.183812	.187724	.191113	.193568	.194362	.192152	−1.36
−1.35	.187109	.191347	.195140	.198109	.199584	.198321	−1.35
−1.34	.190416	.194978	.199173	.202652	.204801	.204473	−1.34
−1.33	.193732	.198616	.203210	.207195	.210009	.210604	−1.33
−1.32	.197056	.202261	.207249	.211734	.215206	.216708	−1.32
−1.31	.200387	.205909	.211288	.216268	.220389	.222782	−1.31
−1.30	.203724	.209561	.215327	.220795	.225554	.228822	−1.30
−1.29	.207066	.213215	.219362	.225312	.230699	.234824	−1.29
−1.28	.210412	.216869	.223394	.229818	.235821	.240785	−1.28
−1.27	.213761	.220522	.227419	.234309	.240917	.246700	−1.27
−1.26	.217111	.224173	.231436	.238785	.245985	.252566	−1.26
−1.25	.220462	.227820	.235444	.243242	.251021	.258381	−1.25
−1.24	.223813	.231463	.239441	.247680	.256025	.264141	−1.24
−1.23	.227162	.235099	.243425	.252095	.260992	.269843	−1.23
−1.22	.230509	.238728	.247394	.256487	.265921	.275484	−1.22
−1.21	.233852	.242348	.251348	.260853	.270810	.281062	−1.21
−1.20	.237190	.245958	.255285	.265191	.275656	.286574	−1.20
−1.19	.240522	.249556	.259203	.269500	.280457	.292019	−1.19
−1.18	.243848	.253142	.263100	.273777	.285212	.297392	−1.18
−1.17	.247165	.256715	.266976	.278022	.289917	.302694	−1.17
−1.16	.250474	.260272	.270828	.282232	.294572	.307920	−1.16
−1.15	.253773	.263813	.274655	.286406	.299175	.313070	−1.15
−1.14	.257060	.267336	.278457	.290541	.303723	.318142	−1.14
−1.13	.260335	.270840	.282231	.294638	.308215	.323134	−1.13
−1.12	.263598	.274325	.285976	.298694	.312650	.328045	−1.12
−1.11	.266846	.277788	.289690	.302707	.317026	.332873	−1.11
−1.10	.270078	.281229	.293374	.306677	.321341	.337616	−1.10
−1.09	.273295	.284647	.297024	.310601	.325594	.342274	−1.09
−1.08	.276494	.288040	.300641	.314479	.329785	.346846	−1.08
−1.07	.279675	.291408	.304222	.318310	.333910	.351330	−1.07
−1.06	.282837	.294749	.307768	.322091	.337970	.355725	−1.06
−1.05	.285979	.298062	.311275	.325823	.341964	.360030	−1.05
−1.04	.289099	.301346	.314744	.329503	.345889	.364246	−1.04
−1.03	.292197	.304600	.318173	.333131	.349746	.368370	−1.03
−1.02	.295272	.307823	.321562	.336706	.353533	.372403	−1.02
−1.01	.298324	.311015	.324908	.340226	.357249	.376344	−1.01
−1.00	.301350	.314173	.328212	.343691	.360894	.380193	−1.00

t	SKEWNESS .0	.1	.2	.3	.4	.5	t
− .99	.244390	.252782	.261708	.271238	.281452	.292450	− .99
− .98	.246809	.255281	.264290	.273908	.284217	.295316	− .98
− .97	.249228	.257775	.266865	.276568	.286967	.298161	− .97
− .96	.251644	.260265	.269432	.279216	.289700	.300984	− .96
− .95	.254059	.262750	.271991	.281852	.292416	.303784	− .95
− .94	.256471	.265230	.274541	.284475	.295115	.306561	− .94
− .93	.258881	.267704	.277082	.287084	.297795	.309314	− .93
− .92	.261286	.270172	.279612	.289679	.300456	.312042	− .92
− .91	.263688	.272632	.282132	.292259	.303097	.314744	− .91
− .90	.266085	.275084	.284640	.294824	.305717	.317420	− .90
− .89	.268477	.277528	.287136	.297372	.308316	.320068	− .89
− .88	.270864	.279964	.289620	.299903	.310893	.322689	− .88
− .87	.273244	.282389	.292090	.302416	.313447	.325281	− .87
− .86	.275618	.284805	.294547	.304911	.315978	.327843	− .86
− .85	.277985	.287210	.296988	.307387	.318484	.330376	− .85
− .84	.280344	.289604	.299415	.309843	.320966	.332877	− .84
− .83	.282694	.291986	.301826	.312279	.323422	.335348	− .83
− .82	.285036	.294356	.304220	.314694	.325852	.337786	− .82
− .81	.287369	.296713	.306598	.317087	.328255	.340191	− .81
− .80	.289692	.299057	.308958	.319458	.330631	.342563	− .80
− .79	.292004	.301386	.311299	.321806	.332978	.344901	− .79
− .78	.294305	.303700	.313622	.324130	.335297	.347205	− .78
− .77	.296595	.306000	.315925	.326431	.337586	.349473	− .77
− .76	.298872	.308283	.318208	.328707	.339846	.351705	− .76
− .75	.301137	.310550	.320471	.330957	.342075	.353901	− .75
− .74	.303389	.312800	.322712	.333181	.344273	.356061	− .74
− .73	.305627	.315032	.324931	.335379	.346439	.358183	− .73
− .72	.307851	.317246	.327128	.337550	.348572	.360267	− .72
− .71	.310060	.319442	.329302	.339693	.350673	.362313	− .71
− .70	.312254	.321618	.331453	.341808	.352741	.364319	− .70
− .69	.314432	.323774	.333579	.343894	.354775	.366287	− .69
− .68	.316593	.325910	.335680	.345950	.356774	.368214	− .68
− .67	.318737	.328025	.337757	.347977	.358739	.370102	− .67
− .66	.320864	.330119	.339807	.349974	.360668	.371949	− .66
− .65	.322972	.332190	.341831	.351939	.362561	.373754	− .65
− .64	.325062	.334239	.343829	.353873	.364419	.375519	− .64
− .63	.327133	.336264	.345798	.355775	.366239	.377241	− .63
− .62	.329184	.338266	.347740	.357645	.368022	.378922	− .62
− .61	.331215	.340244	.349654	.359481	.369768	.380559	− .61
− .60	.333225	.342196	.351538	.361285	.371475	.382155	− .60
− .59	.335213	.344124	.353393	.363054	.373145	.383707	− .59
− .58	.337180	.346026	.355218	.364790	.374775	.385215	− .58
− .57	.339124	.347901	.357013	.366490	.376367	.386680	− .57
− .56	.341046	.349750	.358777	.368156	.377919	.388101	− .56
− .55	.342944	.351571	.360510	.369786	.379431	.389478	− .55
− .54	.344818	.353365	.362210	.371380	.380903	.390810	− .54
− .53	.346668	.355130	.363879	.372938	.382334	.392098	− .53
− .52	.348493	.356867	.365515	.374459	.383725	.393341	− .52
− .51	.350292	.358574	.367117	.375943	.385075	.394540	− .51
− .50	.352065	.360252	.368687	.377390	.386384	.395693	− .50

t	SKEWNESS .6	.7	.8	.9	1.0	1.1	t
− .99	.304350	.317298	.331472	.347099	.364467	.383948	− .99
− .98	.307324	.320388	.334688	.350451	.367967	.387610	− .98
− .97	.310270	.323442	.337857	.353745	.371393	.391179	− .97
− .96	.313188	.326460	.340981	.356979	.374745	.394654	− .96
− .95	.316076	.329440	.344057	.360155	.378023	.398035	− .95
− .94	.318934	.332382	.347085	.363270	.381226	.401323	− .94
− .93	.321762	.335285	.350064	.366325	.384353	.404516	− .93
− .92	.324557	.338148	.352993	.369318	.387404	.407616	− .92
− .91	.327320	.340970	.355872	.372249	.390379	.410622	− .91
− .90	.330050	.343751	.358700	.375117	.393277	.413535	− .90
− .89	.332745	.346490	.361477	.377922	.396099	.416354	− .89
− .88	.335406	.349186	.364201	.380664	.398844	.419081	− .88
− .87	.338031	.351839	.366872	.383342	.401512	.421715	− .87
− .86	.340620	.354447	.369490	.385956	.404103	.424257	− .86
− .85	.343173	.357011	.372054	.388505	.406616	.426706	− .85
− .84	.345687	.359529	.374563	.390989	.409053	.429065	− .84
− .83	.348164	.362001	.377018	.393408	.411412	.431332	− .83
− .82	.350601	.364427	.379417	.395762	.413695	.433509	− .82
− .81	.352999	.366805	.381760	.398049	.415900	.435596	− .81
− .80	.355357	.369136	.384048	.400271	.418028	.437594	− .80
− .79	.357675	.371419	.386278	.402427	.420080	.439504	− .79
− .78	.359951	.373654	.388453	.404517	.422056	.441325	− .78
− .77	.362186	.375839	.390569	.406541	.423955	.443059	− .77
− .76	.364378	.377975	.392629	.408499	.425778	.444707	− .76
− .75	.366528	.380062	.394631	.410390	.427526	.446269	− .75
− .74	.368635	.382098	.396575	.412215	.429199	.447745	− .74
− .73	.370698	.384084	.398462	.413975	.430796	.449138	− .73
− .72	.372716	.386019	.400290	.415668	.432319	.450447	− .72
− .71	.374691	.387903	.402060	.417295	.433769	.451674	− .71
− .70	.376620	.389735	.403771	.418857	.435144	.452819	− .70
− .69	.378505	.391516	.405424	.420352	.436447	.453883	− .69
− .68	.380343	.393245	.407019	.421783	.437676	.454867	− .68
− .67	.382136	.394922	.408555	.423148	.438834	.455773	− .67
− .66	.383882	.396547	.410033	.424449	.439920	.456600	− .66
− .65	.385582	.398119	.411452	.425684	.440935	.457350	− .65
− .64	.387235	.399639	.412813	.426855	.441880	.458024	− .64
− .63	.388841	.401106	.414116	.427962	.442755	.458623	− .63
− .62	.390399	.402520	.415360	.429006	.443561	.459147	− .62
− .61	.391910	.403882	.416546	.429986	.444298	.459598	− .61
− .60	.393373	.405191	.417674	.430902	.444968	.459977	− .60
− .59	.394789	.406446	.418744	.431757	.445570	.460285	− .59
− .58	.396156	.407649	.419757	.432548	.446105	.460523	− .58
− .57	.397474	.408799	.420712	.433278	.446575	.460691	− .57
− .56	.398745	.409896	.421610	.433947	.446980	.460792	− .56
− .55	.399966	.410940	.422451	.434555	.447320	.460825	− .55
− .54	.401140	.411932	.423235	.435102	.447597	.460792	− .54
− .53	.402264	.412871	.423962	.435590	.447811	.460694	− .53
− .52	.403340	.413757	.424634	.436018	.447963	.460532	− .52
− .51	.404367	.414590	.425249	.436387	.448054	.460307	− .51
− .50	.405345	.415372	.425809	.436698	.448084	.460021	− .50

t	SKEWNESS						t
	.0	.1	.2	.3	.4	.5	
− .49	.353812	.361899	.370222	.378799	.387651	.396801	− .49
− .48	.355533	.363516	.371723	.380170	.388876	.397863	− .48
− .47	.357225	.365102	.373189	.381503	.390060	.398880	− .47
− .46	.358890	.366657	.374621	.382797	.391201	.399852	− .46
− .45	.360527	.368179	.376017	.384052	.392300	.400778	− .45
− .44	.362135	.369670	.377377	.385268	.393357	.401658	− .44
− .43	.363714	.371128	.378701	.386444	.394370	.402493	− .43
− .42	.365263	.372552	.379988	.387581	.395341	.403282	− .42
− .41	.366782	.373944	.381239	.388678	.396269	.404025	− .41
− .40	.368270	.375301	.382453	.389735	.397154	.404722	− .40
− .39	.369728	.376624	.383630	.390751	.397996	.405374	− .39
− .38	.371154	.377913	.384768	.391727	.398795	.405980	− .38
− .37	.372548	.379167	.385869	.392662	.399550	.406540	− .37
− .36	.373911	.380385	.386932	.393556	.400262	.407055	− .36
− .35	.375240	.381568	.387956	.394409	.400930	.407525	− .35
− .34	.376537	.382715	.388942	.395221	.401555	.407949	− .34
− .33	.377801	.383826	.389889	.395991	.402136	.408327	− .33
− .32	.379031	.384901	.390797	.396721	.402674	.408661	− .32
− .31	.380226	.385938	.391665	.397408	.403169	.408949	− .31
− .30	.381388	.386939	.392494	.398054	.403620	.409193	− .30
− .29	.382515	.387902	.393284	.398659	.404028	.409391	− .29
− .28	.383606	.388828	.394033	.399221	.404392	.409546	− .28
− .27	.384663	.389716	.394743	.399742	.404713	.409656	− .27
− .26	.385683	.390566	.395413	.400221	.404991	.409722	− .26
− .25	.386668	.391378	.396042	.400658	.405226	.409743	− .25
− .24	.387617	.392152	.396631	.401054	.405418	.409722	− .24
− .23	.388529	.392886	.397180	.401407	.405567	.409656	− .23
− .22	.389404	.393582	.397688	.401719	.405673	.409548	− .22
− .21	.390242	.394239	.398156	.401989	.405736	.409396	− .21
− .20	.391043	.394857	.398583	.402217	.405758	.409202	− .20
− .19	.391806	.395436	.398969	.402404	.405736	.408966	− .19
− .18	.392531	.395975	.399315	.402548	.405673	.408687	− .18
− .17	.393219	.396475	.399620	.402652	.405568	.408367	− .17
− .16	.393868	.396935	.399884	.402714	.405421	.408005	− .16
− .15	.394479	.397355	.400107	.402734	.405233	.407602	− .15
− .14	.395052	.397735	.400290	.402714	.405004	.407158	− .14
− .13	.395585	.398076	.400432	.402652	.404733	.406674	− .13
− .12	.396080	.398376	.400534	.402550	.404422	.406149	− .12
− .11	.396536	.398637	.400594	.402406	.404070	.405585	− .11
− .10	.396953	.398857	.400615	.402222	.403678	.404982	− .10
− .09	.397330	.399038	.400594	.401998	.403247	.404339	− .09
− .08	.397668	.399178	.400534	.401733	.402775	.403658	− .08
− .07	.397966	.399278	.400433	.401429	.402264	.402939	− .07
− .06	.398225	.399338	.400292	.401084	.401715	.402182	− .06
− .05	.398444	.399358	.400111	.400700	.401126	.401388	− .05
− .04	.398623	.399338	.399890	.400277	.400499	.400556	− .04
− .03	.398763	.399278	.399629	.399814	.399834	.399688	− .03
− .02	.398863	.399179	.399329	.399313	.399132	.398784	− .02
− .01	.398922	.399039	.398989	.398773	.398392	.397845	− .01
.00	.398942	.398859	.398610	.398195	.397615	.396870	.00

t	SKEWNESS .6	.7	.8	.9	1.0	1.1	t
− .49	.406274	.416101	.426314	.436950	.448054	.459673	− .49
− .48	.407155	.416778	.426764	.437146	.447965	.459266	− .48
− .47	.407987	.417403	.427159	.437285	.447818	.458800	− .47
− .46	.408770	.417977	.427500	.437368	.447614	.458276	− .46
− .45	.409504	.418500	.427788	.437396	.447354	.457696	− .45
− .44	.410190	.418971	.428022	.437368	.447037	.457060	− .44
− .43	.410827	.419391	.428204	.437287	.446666	.456370	− .43
− .42	.411416	.419761	.428333	.437152	.446241	.455626	− .42
− .41	.411957	.420080	.428410	.436964	.445763	.454830	− .41
− .40	.412450	.420349	.428435	.436723	.445232	.453982	− .40
− .39	.412895	.420569	.428410	.436431	.444650	.453084	− .39
− .38	.413292	.420739	.428334	.436088	.444017	.452137	− .38
− .37	.413641	.420860	.428208	.435695	.443335	.451141	− .37
− .36	.413943	.420933	.428032	.435252	.442603	.450098	− .36
− .35	.414198	.420957	.427808	.434760	.441823	.459009	− .35
− .34	.414406	.420933	.427535	.434220	.440997	.447874	− .34
− .33	.414567	.420861	.427214	.433633	.440124	.446695	− .33
− .32	.414682	.420743	.426846	.432998	.439205	.445473	− .32
− .31	.414751	.420577	.426431	.432318	.438242	.444209	− .31
− .30	.414774	.420365	.425970	.431592	.437234	.442903	− .30
− .29	.414751	.420108	.425463	.430821	.436184	.441557	− .29
− .28	.414683	.419804	.424912	.430007	.435092	.440171	− .28
− .27	.414570	.419456	.424315	.429149	.433958	.438748	− .27
− .26	.414412	.419063	.423675	.428248	.432785	.437286	− .26
− .25	.414211	.418626	.422991	.427306	.431571	.435788	− .25
− .24	.413965	.418146	.422265	.426323	.430319	.434255	− .24
− .23	.413675	.417622	.421497	.425299	.429028	.432687	− .23
− .22	.413343	.417056	.420687	.424235	.427701	.431085	− .22
− .21	.412967	.416448	.419837	.423133	.426338	.429450	− .21
− .20	.412550	.415798	.418946	.421993	.424939	.427784	− .20
− .19	.412090	.415107	.418015	.420815	.423505	.426086	− .19
− .18	.411588	.414375	.417046	.419600	.422037	.424358	− .18
− .17	.411046	.413603	.416038	.418349	.420537	.422601	− .17
− .16	.410462	.412792	.414993	.417064	.419004	.420816	− .16
− .15	.409839	.411942	.413910	.415743	.417440	.419002	− .15
− .14	.409175	.411053	.412791	.414389	.415846	.417162	− .14
− .13	.408472	.410127	.411636	.413001	.414221	.415296	− .13
− .12	.407730	.409163	.410447	.411582	.412568	.413406	− .12
− .11	.406949	.408162	.409222	.410130	.410886	.411490	− .11
− .10	.406131	.407125	.407964	.408648	.409176	.409551	− .10
− .09	.405275	.406053	.406673	.407135	.407440	.407590	− .09
− .08	.404382	.404945	.405349	.405593	.405678	.405607	− .08
− .07	.403452	.403803	.403993	.404022	.403891	.403602	− .07
− .06	.402486	.402627	.402606	.402423	.402079	.401577	− .06
− .05	.401485	.401418	.401188	.400796	.400243	.399533	− .05
− .04	.400448	.400176	.399740	.399143	.398385	.397469	− .04
− .03	.399377	.398902	.398263	.397463	.396504	.395387	− .03
− .02	.398272	.397596	.396758	.395758	.394601	.393288	− .02
− .01	.397134	.396260	.395224	.394029	.392677	.391172	− .01
.00	.395962	.394892	.393663	.392276	.390734	.389040	.00

t	SKEWNESS						t
	.0	.1	.2	.3	.4	.5	
.00	.398942	.398859	.398610	.398195	.397615	.396870	.00
.01	.398922	.398640	.398192	.397579	.396801	.395861	.01
.02	.398863	.398381	.397735	.396925	.395952	.394817	.02
.03	.398763	.398083	.397239	.396233	.395066	.393739	.03
.04	.398623	.397745	.396705	.395505	.394145	.392629	.04
.05	.398444	.397368	.396133	.394739	.393189	.391485	.05
.06	.398225	.396952	.395523	.393938	.392199	.390309	.06
.07	.397966	.396498	.394875	.393100	.391174	.389101	.07
.08	.397668	.396004	.394190	.392226	.390116	.387862	.08
.09	.397330	.395472	.393467	.391317	.389024	.386591	.09
.10	.396953	.394902	.392708	.390373	.387900	.385291	.10
.11	.396536	.394294	.391912	.389394	.386743	.383960	.11
.12	.396080	.393647	.391080	.388381	.385554	.382600	.12
.13	.395585	.392963	.390212	.387334	.384333	.381212	.13
.14	.395052	.392242	.389308	.386254	.383081	.379795	.14
.15	.394479	.391483	.388369	.385140	.381799	.378350	.15
.16	.393868	.390688	.387395	.383994	.380487	.376877	.16
.17	.393219	.389855	.386386	.382815	.379145	.375378	.17
.18	.392531	.388987	.385344	.381605	.377774	.373853	.18
.19	.391806	.388082	.384267	.380363	.376374	.372302	.19
.20	.391043	.387142	.383157	.379090	.374946	.370725	.20
.21	.390242	.386166	.382013	.377787	.373490	.369124	.21
.22	.389404	.385154	.380837	.376453	.372006	.367499	.22
.23	.388529	.384109	.379628	.375090	.370497	.365850	.23
.24	.387617	.383028	.378388	.373698	.368961	.364178	.24
.25	.386668	.381913	.377116	.372277	.367399	.362483	.25
.26	.385683	.380765	.375812	.370827	.365812	.360767	.26
.27	.384663	.379583	.374479	.369350	.364200	.359028	.27
.28	.383606	.378368	.373114	.367846	.362564	.357269	.28
.29	.382515	.377120	.371720	.366315	.360904	.355489	.29
.30	.381388	.375840	.370297	.364757	.359221	.353689	.30
.31	.380226	.374529	.368844	.363173	.357515	.351870	.31
.32	.379031	.373185	.367363	.361564	.355787	.350032	.32
.33	.377801	.371811	.365854	.359930	.354038	.348176	.33
.34	.376537	.370405	.364318	.358272	.352267	.346301	.34
.35	.375240	.368970	.362754	.356590	.350476	.344409	.35
.36	.373911	.367505	.361163	.354884	.348664	.342501	.36
.37	.372548	.366010	.359547	.353156	.346833	.340576	.37
.38	.371154	.364486	.357904	.351405	.344983	.338636	.38
.39	.369728	.362934	.356237	.349632	.343114	.336680	.39
.40	.368270	.361354	.354545	.347838	.341227	.334709	.40
.41	.366782	.359746	.352828	.346022	.339323	.332724	.41
.42	.365263	.358110	.351088	.344187	.337401	.330726	.42
.43	.363714	.356449	.349324	.342331	.335463	.328714	.43
.44	.362135	.354761	.347538	.340457	.333509	.326689	.44
.45	.360527	.353047	.345729	.338563	.331540	.324652	.45
.46	.358890	.351308	.343899	.336651	.329555	.322604	.46
.47	.357225	.349544	.342047	.334721	.327556	.320544	.47
.48	.355533	.347757	.340174	.332774	.325544	.318474	.48
.49	.353812	.345945	.338282	.330810	.323517	.316393	.49

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
.00	.395962	.394892	.393663	.392276	.390734	.389040	.00
.01	.394758	.393496	.392075	.390499	.388770	.386893	.01
.02	.393522	.392069	.390461	.388699	.386788	.384731	.02
.03	.392255	.390615	.388821	.386878	.384788	.382555	.03
.04	.390957	.389132	.387157	.385035	.382770	.380366	.04
.05	.389628	.387621	.385468	.383171	.380735	.378164	.05
.06	.388270	.386084	.383756	.381288	.378684	.375950	.06
.07	.386882	.384521	.382021	.379385	.376618	.373724	.07
.08	.385466	.382932	.380263	.377463	.374536	.371487	.08
.09	.384021	.381318	.378483	.375523	.372440	.369241	.09
.10	.382549	.379679	.376683	.373565	.370331	.366984	.10
.11	.381050	.378016	.374862	.371591	.368208	.364719	.11
.12	.379525	.376330	.373021	.369600	.366073	.362445	.12
.13	.377973	.374621	.371160	.367593	.363926	.360163	.13
.14	.376396	.372891	.369281	.365572	.361768	.357874	.14
.15	.374795	.371138	.367384	.363536	.359598	.355577	.15
.16	.373169	.369364	.365469	.361485	.357419	.353275	.16
.17	.371519	.367571	.363537	.359422	.355230	.350967	.17
.18	.369846	.365757	.361588	.357345	.353032	.348653	.18
.19	.368151	.363923	.359624	.355257	.350826	.346335	.19
.20	.366433	.362072	.357645	.353156	.348611	.344013	.20
.21	.361694	.360201	.355651	.351045	.346389	.341687	.21
.22	.362934	.358314	.353642	.348923	.344160	.339357	.22
.23	.361153	.356409	.351620	.346791	.341924	.337025	.23
.24	.359353	.354488	.349585	.344649	.339683	.334690	.24
.25	.357533	.352550	.347538	.342498	.337436	.332353	.25
.26	.355694	.350598	.345478	.340339	.335184	.330015	.26
.27	.353838	.348630	.343407	.338172	.332927	.327676	.27
.28	.351963	.346648	.341325	.335997	.330667	.325336	.28
.29	.350071	.344652	.339233	.333816	.328403	.322996	.29
.30	.348163	.342643	.337131	.331627	.326135	.320657	.30
.31	.346239	.340621	.335019	.329433	.323865	.318317	.31
.32	.344299	.338587	.332898	.327233	.321593	.315979	.32
.33	.342343	.336541	.330769	.325028	.319319	.313642	.33
.34	.340374	.334484	.328632	.322818	.317043	.311307	.34
.35	.338390	.332416	.326488	.320604	.314766	.308974	.35
.36	.336393	.330338	.324337	.318387	.312489	.306644	.36
.37	.334383	.328251	.322179	.316166	.310212	.304316	.37
.38	.332360	.326154	.320015	.313942	.307934	.301991	.38
.39	.330325	.324048	.317845	.311716	.305657	.299670	.39
.40	.328279	.321934	.315671	.309487	.303381	.297352	.40
.41	.326222	.319812	.313491	.307257	.301107	.295039	.41
.42	.324154	.317683	.311308	.305026	.298834	.292730	.42
.43	.322077	.315547	.309120	.302793	.296563	.290426	.43
.44	.319989	.313405	.306930	.300561	.294294	.288127	.44
.45	.317893	.311256	.304736	.298328	.292028	.285833	.45
.46	.315788	.309102	.302540	.296095	.289765	.283544	.46
.47	.313675	.306943	.300341	.293863	.287505	.281262	.47
.48	.311555	.304780	.298141	.291632	.285248	.278985	.48
.49	.309427	.302612	.295939	.289402	.282996	.276715	.49

t	SKEWNESS .0	.1	.2	.3	.4	.5	t
.50	.352065	.344110	.336369	.328830	.321478	.314302	.50
.51	.350292	.342252	.334438	.326833	.319426	.312202	.51
.52	.348493	.340372	.332487	.324822	.317362	.310093	.52
.53	.346668	.338470	.330519	.322796	.315286	.307976	.53
.54	.344818	.336547	.328533	.320756	.313200	.305851	.54
.55	.342944	.334604	.326529	.318701	.311103	.303719	.55
.56	.341046	.332640	.324509	.316634	.308796	.301579	.56
.57	.339124	.330656	.322473	.314554	.306879	.299433	.57
.58	.337180	.328653	.320421	.312461	.304754	.297281	.58
.59	.335213	.326632	.318354	.310357	.302620	.295124	.59
.60	.333225	.324592	.316273	.308242	.300477	.292961	.60
.61	.331215	.322535	.314178	.306115	.298327	.290793	.61
.62	.329184	.320461	.312068	.303979	.296170	.288621	.62
.63	.327133	.318370	.309946	.301833	.294006	.286445	.63
.64	.325062	.316264	.307811	.299677	.291836	.284266	.64
.65	.322972	.314142	.305565	.297513	.289660	.282083	.65
.66	.320864	.312004	.303507	.295340	.287478	.279898	.66
.67	.318737	.309853	.301337	.293159	.285292	.277711	.67
.68	.316593	.307687	.299157	.290971	.283101	.275521	.68
.69	.314432	.305508	.296968	.288776	.280906	.273331	.69
.70	.312254	.303317	.294768	.286575	.278707	.271139	.70
.71	.310060	.301113	.292560	.284368	.276505	.268946	.71
.72	.307851	.298897	.290343	.282155	.274301	.266754	.72
.73	.305627	.296670	.288118	.279937	.272094	.264561	.73
.74	.303389	.294432	.285886	.277714	.269885	.262369	.74
.75	.301137	.292184	.283647	.275488	.267674	.260177	.75
.76	.298872	.289926	.281401	.273257	.265462	.257987	.76
.77	.296595	.287659	.279148	.271023	.263250	.255798	.77
.78	.294305	.285384	.276891	.268787	.261037	.253611	.78
.79	.292004	.283100	.274628	.266548	.258824	.251426	.79
.80	.289692	.280809	.272360	.264307	.256612	.249244	.80
.81	.287369	.278510	.270089	.262064	.254400	.247065	.81
.82	.285036	.276205	.267813	.259820	.252189	.244888	.82
.83	.282694	.273893	.265535	.257576	.249980	.242716	.83
.84	.280344	.271576	.263253	.255331	.247773	.240547	.84
.85	.277985	.269254	.260969	.253086	.245568	.238382	.85
.86	.275618	.266928	.258683	.250842	.243365	.236222	.86
.87	.273244	.264597	.256396	.248598	.241166	.234066	.87
.88	.270864	.262262	.254107	.246356	.238970	.231915	.88
.89	.268477	.259924	.251818	.244115	.236777	.229770	.89
.90	.266085	.257584	.249529	.241876	.234588	.227630	.90
.91	.263688	.255241	.247240	.239640	.232403	.225496	.91
.92	.261286	.252897	.244952	.237406	.230223	.223368	.92
.93	.258881	.250551	.242664	.235176	.228048	.221247	.93
.94	.256471	.248204	.240378	.232949	.225878	.219132	.94
.95	.254059	.245857	.238094	.230725	.223713	.217024	.95
.96	.251644	.243510	.235812	.228506	.221554	.214923	.96
.97	.249228	.241164	.233533	.226291	.219401	.212829	.97
.98	.246809	.238818	.231256	.224081	.217254	.210744	.98
.99	.244390	.236474	.228984	.221876	.215114	.208665	.99

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
.50	.307293	.300440	.293736	.287174	.280748	.274451	.50
.51	.305152	.298265	.291533	.284948	.278504	.272195	.51
.52	.303005	.296087	.289330	.282725	.276265	.269945	.52
.53	.300853	.293907	.287126	.280504	.274031	.267703	.53
.54	.298696	.291724	.284923	.278286	.271803	.265468	.54
.55	.296535	.289539	.282721	.276071	.269580	.263241	.55
.56	.294369	.287354	.280520	.273860	.267363	.261022	.56
.57	.292200	.285167	.278321	.271653	.265152	.258811	.57
.58	.290028	.282979	.276124	.269449	.262947	.256608	.58
.59	.287852	.280792	.273928	.267251	.260749	.254414	.59
.60	.285675	.278604	.271736	.265057	.258558	.252228	.60
.61	.283495	.276417	.269546	.262868	.256373	.250052	.61
.62	.281313	.274231	.267359	.260685	.254196	.247885	.62
.63	.279131	.272046	.265175	.258506	.252027	.245727	.63
.64	.276947	.269862	.262996	.256334	.249865	.243578	.64
.65	.274763	.267680	.260820	.254168	.247711	.241439	.65
.66	.272578	.265501	.258649	.252008	.245565	.239310	.66
.67	.270394	.263324	.256482	.249855	.243428	.237190	.67
.68	.268211	.261150	.254320	.247708	.241299	.235081	.68
.69	.266028	.258978	.252164	.245568	.239178	.232981	.69
.70	.263847	.256811	.250012	.243436	.237066	.230892	.70
.71	.261667	.254647	.247867	.241310	.234964	.228813	.71
.72	.259489	.252487	.245727	.239193	.232870	.226745	.72
.73	.257314	.250331	.243593	.237083	.230786	.224688	.73
.74	.255141	.248180	.241466	.234981	.228711	.222641	.74
.75	.252971	.246034	.239345	.232888	.226646	.220605	.75
.76	.250805	.243893	.237231	.230802	.224590	.218581	.76
.77	.248642	.241757	.235125	.228726	.222544	.216567	.77
.78	.246482	.239627	.233025	.226658	.220509	.214564	.78
.79	.244327	.237503	.230933	.224599	.218483	.212573	.79
.80	.242177	.235385	.228849	.222548	.216468	.210593	.80
.81	.240031	.233274	.226772	.220508	.214463	.208624	.81
.82	.237890	.231169	.224704	.218476	.212469	.206667	.82
.83	.235754	.229071	.222644	.216454	.210485	.204722	.83
.84	.233624	.226980	.220592	.214442	.208512	.202788	.84
.85	.231500	.224896	.218549	.212439	.206550	.200866	.85
.86	.229381	.222820	.216515	.210447	.204598	.198955	.86
.87	.227269	.220751	.214489	.208464	.202658	.197057	.87
.88	.225164	.218691	.212473	.206492	.200729	.195170	.88
.89	.223066	.216638	.210466	.204529	.198811	.193295	.89
.90	.220974	.214594	.208469	.202578	.196904	.191433	.90
.91	.218890	.212559	.206481	.200637	.195009	.189582	.91
.92	.216813	.210532	.204503	.198706	.193125	.187743	.92
.93	.214744	.208514	.202534	.196786	.191252	.185917	.93
.94	.212683	.206505	.200576	.194877	.189391	.184103	.94
.95	.210630	.204505	.198628	.192979	.187541	.182300	.95
.96	.208585	.202515	.196690	.191092	.185704	.180510	.96
.97	.206549	.200534	.194762	.189216	.183878	.178733	.97
.98	.204521	.198562	.192845	.187351	.182063	.176967	.98
.99	.202503	.196601	.190939	.185498	.180261	.175214	.99

t	SKEWNESS .0	.1	.2	.3	.4	.5	t
1.00	.241971	.234132	.226714	.219676	.212981	.206595	1.00
1.01	.239551	.231792	.224449	.217482	.210854	.204534	1.01
1.02	.237132	.229454	.222189	.215295	.208736	.202480	1.02
1.03	.234714	.227120	.219933	.213113	.206624	.200436	1.03
1.04	.232297	.224789	.217683	.210938	.204521	.198400	1.04
1.05	.229882	.222462	.215438	.208770	.202426	.196373	1.05
1.06	.227470	.220139	.213199	.206610	.200339	.194356	1.06
1.07	.225060	.217821	.210966	.204456	.198260	.192348	1.07
1.08	.222653	.215508	.208739	.202311	.196191	.190350	1.08
1.09	.220251	.213200	.206520	.200174	.194130	.188361	1.09
1.10	.217852	.210898	.204307	.198044	.192079	.186383	1.10
1.11	.215458	.208602	.202102	.195924	.190037	.184414	1.11
1.12	.213069	.206313	.199905	.193812	.188004	.182456	1.12
1.13	.210686	.204031	.197716	.191709	.185982	.180509	1.13
1.14	.208309	.201755	.195535	.189616	.183969	.178572	1.14
1.15	.205936	.199488	.193363	.187531	.181967	.176645	1.15
1.16	.203571	.197228	.191200	.185457	.179975	.174730	1.16
1.17	.201214	.194977	.189046	.183393	.177993	.172826	1.17
1.18	.198863	.192734	.186901	.181338	.176023	.170933	1.18
1.19	.196520	.190500	.184766	.179295	.174063	.169051	1.19
1.20	.194186	.188275	.182641	.177261	.172114	.167180	1.20
1.21	.191860	.186059	.180526	.175239	.170176	.165321	1.21
1.22	.189543	.183854	.178422	.173227	.168250	.163474	1.22
1.23	.187235	.181658	.176328	.171227	.166335	.161639	1.23
1.24	.184937	.179473	.174245	.169237	.164432	.159815	1.24
1.25	.182649	.177298	.172174	.167260	.162541	.158003	1.25
1.26	.180371	.175134	.170113	.165294	.160661	.156203	1.26
1.27	.178104	.172982	.168064	.163339	.158794	.154416	1.27
1.28	.175847	.170840	.166027	.161397	.156938	.152640	1.28
1.29	.173602	.168711	.164002	.159467	.155095	.150877	1.29
1.30	.171369	.166593	.161989	.157549	.153264	.149127	1.30
1.31	.169147	.164487	.159988	.155644	.151446	.147388	1.31
1.32	.166937	.162394	.158000	.153751	.149640	.145663	1.32
1.33	.164740	.160313	.156024	.151871	.147847	.143949	1.33
1.34	.162555	.158245	.154062	.150003	.146067	.142249	1.34
1.35	.160383	.156190	.152112	.148149	.144299	.140561	1.35
1.36	.158225	.154149	.150175	.146307	.142545	.138886	1.36
1.37	.156080	.152120	.148252	.144479	.140803	.137224	1.37
1.38	.153948	.150105	.146342	.142664	.139074	.135574	1.38
1.39	.151831	.148104	.144445	.140862	.137359	.133938	1.39
1.40	.149727	.146117	.142563	.139074	.135656	.132314	1.40
1.41	.147639	.144144	.140694	.137299	.133967	.130703	1.41
1.42	.145564	.142185	.138839	.135538	.132292	.129106	1.42
1.43	.143505	.140241	.136998	.133790	.130629	.127521	1.43
1.44	.141460	.138311	.135171	.132057	.128980	.125949	1.44
1.45	.139431	.136396	.133359	.130337	.127345	.124391	1.45
1.46	.137417	.134496	.131561	.128631	.125723	.122845	1.46
1.47	.135418	.132611	.129777	.126939	.124114	.121313	1.47
1.48	.133435	.130741	.128008	.125261	.122519	.119794	1.48
1.49	.131468	.128886	.126253	.123598	.120938	.118287	1.49

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
1.00	.200493	.194649	.189043	.183655	.178470	.173473	1.00
1.01	.198493	.192708	.187158	.181824	.176691	.171745	1.01
1.02	.196502	.190777	.185284	.180005	.174925	.170028	1.02
1.03	.194521	.188856	.183421	.178197	.173170	.168324	1.03
1.04	.192549	.186945	.181569	.176401	.171427	.166633	1.04
1.05	.190588	.185046	.179728	.174616	.169696	.164954	1.05
1.06	.188636	.183157	.177898	.172843	.167977	.163287	1.06
1.07	.186695	.181278	.176080	.171082	.166271	.161632	1.07
1.08	.184764	.179411	.174273	.169333	.164576	.159990	1.08
1.09	.182843	.177555	.172478	.167595	.162894	.158360	1.09
1.10	.180933	.175710	.170694	.165870	.161223	.156743	1.10
1.11	.179034	.173876	.168922	.164156	.159565	.155137	1.11
1.12	.177146	.172053	.167161	.162454	.157919	.153545	1.12
1.13	.175268	.170242	.165412	.160764	.156285	.151964	1.13
1.14	.173402	.168442	.163675	.159086	.154664	.150396	1.14
1.15	.171547	.166654	.161950	.157421	.153054	.148840	1.15
1.16	.169703	.164877	.160236	.155767	.151457	.147296	1.16
1.17	.167871	.163112	.158535	.154125	.149872	.145764	1.17
1.18	.166050	.161359	.156845	.152496	.148299	.144245	1.18
1.19	.164241	.159618	.155168	.150878	.146738	.142737	1.19
1.20	.162444	.157889	.153502	.149273	.145189	.141242	1.20
1.21	.160658	.156171	.151849	.147679	.143653	.139759	1.21
1.22	.158884	.154466	.150207	.146098	.142128	.138289	1.22
1.23	.157122	.152772	.148578	.144529	.140616	.136830	1.23
1.24	.155372	.151091	.146961	.142972	.139116	.135383	1.24
1.25	.153634	.149422	.145356	.141427	.137627	.133948	1.25
1.26	.151908	.147765	.143763	.139895	.136151	.132526	1.26
1.27	.150195	.146120	.142183	.138374	.134687	.131115	1.27
1.28	.148493	.144487	.140614	.136866	.133235	.129716	1.28
1.29	.146804	.142867	.139058	.135369	.131795	.128328	1.29
1.30	.145127	.141259	.137514	.133885	.130367	.126953	1.30
1.31	.143463	.139663	.135982	.132413	.128951	.125590	1.31
1.32	.141811	.138080	.134462	.130953	.127546	.124238	1.32
1.33	.140172	.136509	.132955	.129505	.126154	.122897	1.33
1.34	.138545	.134950	.131459	.128069	.124773	.121569	1.34
1.35	.136931	.133404	.129976	.126645	.123404	.120252	1.35
1.36	.135329	.131870	.128505	.125232	.122047	.118946	1.36
1.37	.133740	.130348	.127047	.123832	.120702	.117652	1.37
1.38	.132163	.128839	.125600	.122444	.119368	.116370	1.38
1.39	.130599	.127342	.124166	.121068	.118046	.115099	1.39
1.40	.129048	.125858	.122743	.119703	.116736	.113839	1.40
1.41	.127509	.124386	.121333	.118350	.115437	.112590	1.41
1.42	.125983	.122926	.119935	.117009	.114149	.111353	1.42
1.43	.124470	.121479	.118549	.115680	.112873	.110127	1.43
1.44	.122969	.120044	.117175	.114363	.111609	.108912	1.44
1.45	.121482	.118621	.115813	.113057	.110356	.107708	1.45
1.46	.120007	.117211	.114463	.111763	.109114	.106515	1.46
1.47	.118544	.115813	.113125	.110481	.107883	.105333	1.47
1.48	.117094	.114428	.111798	.109210	.106664	.104162	1.48
1.49	.115657	.113054	.110484	.107950	.105456	.103002	1.49

t	SKEWNESS .0	.1	.2	.3	.4	.5	t
1.50	.129518	.127046	.124514	.121948	.119370	.116794	1.50
1.51	.127583	.125222	.122789	.120312	.117816	.115314	1.51
1.52	.125665	.123414	.121079	.118691	.116275	.113848	1.52
1.53	.123763	.121621	.119383	.117084	.114748	.112394	1.53
1.54	.121878	.119844	.117703	.115492	.113235	.110953	1.54
1.55	.120009	.118082	.116038	.113913	.111736	.109526	1.55
1.56	.118157	.116337	.114388	.112349	.110250	.108112	1.56
1.57	.116323	.114607	.112753	.110799	.108778	.106710	1.57
1.58	.114505	.112894	.111133	.109264	.107319	.105322	1.58
1.59	.112704	.111196	.109528	.107743	.105874	.103947	1.59
1.60	.110921	.109515	.107939	.106237	.104443	.102585	1.60
1.61	.109155	.107850	.106365	.104745	.103026	.101236	1.61
1.62	.107406	.106201	.104806	.103267	.101622	.099900	1.62
1.63	.105675	.104569	.103262	.101804	.100232	.098577	1.63
1.64	.103961	.102953	.101733	.100355	.098856	.097266	1.64
1.65	.102265	.101353	.100220	.098920	.097493	.095969	1.65
1.66	.100586	.099769	.098723	.097500	.096143	.094685	1.66
1.67	.098925	.098202	.097240	.096094	.094808	.093413	1.67
1.68	.097282	.096652	.095773	.094703	.093485	.092154	1.68
1.69	.095657	.095117	.094321	.093326	.092177	.090908	1.69
1.70	.094049	.093599	.092884	.091963	.090881	.089674	1.70
1.71	.092459	.092098	.091463	.090615	.089599	.088454	1.71
1.72	.090887	.090613	.090057	.089280	.088331	.087245	1.72
1.73	.089333	.089144	.088666	.087960	.087076	.086050	1.73
1.74	.087796	.087692	.087290	.086654	.085834	.084867	1.74
1.75	.086277	.086256	.085930	.085363	.084605	.083696	1.75
1.76	.084776	.084837	.084584	.084085	.083390	.082538	1.76
1.77	.083293	.083433	.083254	.082822	.082187	.081392	1.77
1.78	.081828	.082046	.081939	.081572	.080998	.080258	1.78
1.79	.080380	.080676	.080639	.080336	.079822	.079137	1.79
1.80	.078950	.079321	.079354	.079115	.078659	.078028	1.80
1.81	.077538	.077983	.078083	.077907	.077508	.076930	1.81
1.82	.076143	.076661	.076828	.076713	.076371	.075845	1.82
1.83	.074766	.075355	.075587	.075533	.075246	.074772	1.83
1.84	.073407	.074065	.074362	.074366	.074134	.073711	1.84
1.85	.072065	.072791	.073150	.073213	.073035	.072662	1.85
1.86	.070740	.071533	.071954	.072074	.071949	.071625	1.86
1.87	.069433	.070291	.070772	.070948	.070875	.070599	1.87
1.88	.068144	.069065	.069605	.069835	.069813	.069585	1.88
1.89	.066871	.067855	.068452	.068736	.068764	.068582	1.89
1.90	.065616	.066660	.067314	.067650	.067727	.067591	1.90
1.91	.064378	.065480	.066189	.066577	.066703	.066612	1.91
1.92	.063157	.064317	.065079	.065518	.065690	.065644	1.92
1.93	.061952	.063168	.063984	.064471	.064690	.064687	1.93
1.94	.060765	.062035	.062902	.063438	.063702	.063741	1.94
1.95	.059595	.060917	.061834	.062417	.062726	.062807	1.95
1.96	.058441	.059815	.060780	.061410	.061762	.061883	1.96
1.97	.057304	.058727	.059740	.060415	.060809	.060971	1.97
1.98	.056183	.057655	.058714	.059432	.059868	.060069	1.98
1.99	.055079	.056598	.057701	.058463	.058939	.059179	1.99

t	SKEWNESS .6	.7	.8	.9	1.0	1.1	t
1.50	.114233	.111693	.109182	.106702	.104259	.101852	1.50
1.51	.112821	.110344	.107891	.105466	.103073	.100714	1.51
1.52	.111422	.109008	.106612	.104241	.101898	.099586	1.52
1.53	.110036	.107683	.105345	.103027	.100733	.098468	1.53
1.54	.108662	.106371	.104090	.101824	.099580	.097361	1.54
1.55	.107300	.105071	.102846	.100633	.098438	.096265	1.55
1.56	.105952	.103782	.101614	.099453	.097307	.095179	1.56
1.57	.104616	.102506	.100393	.098284	.096186	.094103	1.57
1.58	.103292	.101242	.099184	.097126	.095076	.093037	1.58
1.59	.101981	.099990	.097986	.095979	.093976	.091982	1.59
1.60	.100682	.098750	.096800	.094844	.092887	.090937	1.60
1.61	.099396	.097521	.095625	.093719	.091809	.089902	1.61
1.62	.098122	.096305	.094462	.092605	.090741	.088877	1.62
1.63	.096860	.095100	.093310	.091501	.089683	.087862	1.63
1.64	.095611	.093907	.092169	.090409	.088636	.086857	1.64
1.65	.094374	.092725	.091039	.089327	.087599	.085862	1.65
1.66	.093149	.091555	.089920	.088256	.086572	.084877	1.66
1.67	.091936	.090397	.088813	.087195	.085555	.083901	1.67
1.68	.090735	.089251	.087716	.086145	.084548	.082935	1.68
1.69	.089547	.088115	.086630	.085105	.083552	.081979	1.69
1.70	.088371	.086992	.085555	.084076	.082565	.081032	1.70
1.71	.087206	.085879	.084491	.083057	.081588	.080094	1.71
1.72	.086053	.084778	.083438	.082048	.080621	.079166	1.72
1.73	.084913	.083688	.082395	.081050	.079663	.078247	1.73
1.74	.083784	.082610	.081363	.080061	.078716	.077338	1.74
1.75	.082667	.081542	.080342	.079083	.077777	.076437	1.75
1.76	.081561	.080486	.079331	.078114	.076849	.075546	1.76
1.77	.080468	.079440	.078331	.077156	.075930	.074664	1.77
1.78	.079385	.078406	.077341	.076208	.075020	.073790	1.78
1.79	.078315	.077382	.076361	.075269	.074120	.072926	1.79
1.80	.077256	.076370	.075392	.074340	.073229	.072071	1.80
1.81	.076208	.075368	.074432	.073421	.072347	.071224	1.81
1.82	.075171	.074376	.073483	.072511	.071474	.070386	1.82
1.83	.074146	.073396	.072544	.071611	.070611	.069557	1.83
1.84	.073132	.072426	.071615	.070720	.069756	.068736	1.84
1.85	.072129	.071466	.070696	.069839	.068910	.067924	1.85
1.86	.071138	.070517	.069787	.068967	.068073	.067120	1.86
1.87	.070157	.069578	.068887	.068104	.067245	.066324	1.87
1.88	.069187	.068650	.067998	.067251	.066426	.065537	1.88
1.89	.068228	.067732	.067118	.066407	.065616	.064758	1.89
1.90	.067280	.066823	.066247	.065571	.064814	.063988	1.90
1.91	.066342	.065926	.065386	.064745	.064020	.063225	1.91
1.92	.065416	.065038	.064535	.063928	.063235	.062471	1.92
1.93	.064499	.064160	.063692	.063120	.062459	.061724	1.93
1.94	.063594	.063291	.062860	.062320	.061690	.060986	1.94
1.95	.062699	.062433	.062036	.061529	.060930	.060255	1.95
1.96	.061814	.061584	.061222	.060747	.060179	.059532	1.96
1.97	.060939	.060745	.060416	.059973	.059435	.058817	1.97
1.98	.060075	.059916	.059620	.059208	.058699	.058109	1.98
1.99	.059221	.059096	.058833	.058452	.057972	.057409	1.99

t	SKEWNESS .0	.1	.2	.3	.4	.5	t
2.00	.053991	.055555	.056702	.057505	.058022	.058299	2.00
2.01	.052919	.054527	.055717	.056560	.057116	.057430	2.01
2.02	.051864	.053513	.054745	.055628	.056221	.056571	2.02
2.03	.050824	.052515	.053786	.054708	.055338	.055723	2.03
2.04	.049800	.051530	.052840	.053799	.054466	.054886	2.04
2.05	.048792	.050560	.051907	.052903	.053605	.054059	2.05
2.06	.047800	.049604	.050988	.052019	.052755	.053242	2.06
2.07	.046823	.048662	.050081	.051147	.051916	.052435	2.07
2.08	.045861	.047734	.049187	.050286	.051088	.051638	2.08
2.09	.044915	.046820	.048306	.049437	.050271	.050852	2.09
2.10	.043984	.045920	.047437	.048600	.049464	.050075	2.10
2.11	.043067	.045033	.046581	.047774	.048668	.049308	2.11
2.12	.042166	.044160	.045737	.046960	.047883	.048552	2.12
2.13	.041280	.043300	.044905	.046157	.047108	.047804	2.13
2.14	.040408	.042454	.044086	.045365	.046343	.047067	2.14
2.15	.039550	.041620	.043278	.044584	.045589	.046339	2.15
2.16	.038707	.040800	.042483	.043814	.044845	.045620	2.16
2.17	.037878	.039993	.041699	.043055	.044111	.044911	2.17
2.18	.037063	.039198	.040927	.042307	.043387	.044211	2.18
2.19	.036262	.038416	.040167	.041569	.042673	.043520	2.19
2.20	.035475	.037647	.039418	.040842	.041968	.042838	2.20
2.21	.034701	.036890	.038680	.040126	.041274	.042166	2.21
2.22	.033941	.036145	.037954	.039420	.040589	.041502	2.22
2.23	.033194	.035413	.037239	.038724	.039913	.040847	2.23
2.24	.032460	.034693	.036535	.038038	.039247	.040201	2.24
2.25	.031740	.033984	.035842	.037363	.038591	.039564	2.25
2.26	.031032	.033287	.035160	.036698	.037943	.038935	2.26
2.27	.030337	.032602	.034489	.036042	.037305	.038315	2.27
2.28	.029655	.031929	.033828	.035396	.036676	.037703	2.28
2.29	.028985	.031267	.033177	.034760	.036055	.037100	2.29
2.30	.028327	.030616	.032537	.034134	.035444	.036505	2.30
2.31	.027682	.029976	.031908	.033517	.034842	.035918	2.31
2.32	.027048	.029347	.031288	.032909	.034248	.035339	2.32
2.33	.026426	.028730	.030678	.032310	.033663	.034768	2.33
2.34	.025817	.028123	.030079	.031721	.033086	.034205	2.34
2.35	.025218	.027526	.029489	.031141	.032518	.033650	2.35
2.36	.024631	.026940	.028909	.030570	.031958	.033103	2.36
2.37	.024056	.026365	.028338	.030008	.031406	.032563	2.37
2.38	.023491	.025799	.027777	.029454	.030862	.032031	2.38
2.39	.022937	.025244	.027225	.028909	.030327	.031507	2.39
2.40	.022395	.024699	.026683	.028373	.029800	.030990	2.40
2.41	.021862	.024163	.026149	.027845	.029280	.030480	2.41
2.42	.021341	.023638	.025625	.027326	.028768	.029978	2.42
2.43	.020829	.023122	.025109	.026815	.028264	.029483	2.43
2.44	.020328	.022615	.024603	.026312	.027768	.028995	2.44
2.45	.019837	.022118	.024105	.025817	.027279	.028514	2.45
2.46	.019356	.021630	.023615	.025330	.026797	.028040	2.46
2.47	.018885	.021151	.023134	.024851	.026323	.027573	2.47
2.48	.018423	.020681	.022662	.024380	.025856	.027113	2.48
2.49	.017971	.020220	.022197	.023916	.025397	.026659	2.49

t	SKEWNESS .6	.7	.8	.9	1.0	1.1	t
2.00	.058376	.058286	.058054	.057703	.057252	.056717	2.00
2.01	.057542	.057485	.057284	.056963	.056541	.056032	2.01
2.02	.056718	.056693	.056523	.056232	.055837	.055354	2.02
2.03	.055903	.055910	.055771	.055508	.055140	.054684	2.03
2.04	.055099	.055137	.055028	.054793	.054452	.054021	2.04
2.05	.054304	.054373	.054293	.054086	.053771	.053365	2.05
2.06	.053518	.053617	.053566	.053386	.053098	.052717	2.06
2.07	.052743	.052871	.052848	.052695	.052432	.052075	2.07
2.08	.051976	.052134	.052138	.052011	.051773	.051441	2.08
2.09	.051219	.051405	.051436	.051335	.051122	.050813	2.09
2.10	.050471	.050685	.050743	.050667	.050478	.050192	2.10
2.11	.049733	.049973	.050057	.050007	.049842	.049579	2.11
2.12	.049003	.049271	.049380	.049354	.049212	.048971	2.12
2.13	.048283	.048576	.048710	.048709	.048590	.048371	2.13
2.14	.047572	.047890	.048049	.048071	.047975	.047777	2.14
2.15	.046869	.047212	.047395	.047440	.047366	.047190	2.15
2.16	.046176	.046543	.046749	.046817	.046765	.046610	2.16
2.17	.045491	.045882	.046111	.046201	.046170	.046036	2.17
2.18	.044814	.045229	.045480	.045592	.045582	.045468	2.18
2.19	.044147	.044584	.044857	.044990	.045001	.044907	2.19
2.20	.043488	.043947	.044242	.044395	.044427	.044352	2.20
2.21	.042837	.043317	.043634	.043808	.043859	.043803	2.21
2.22	.042194	.042696	.043033	.043227	.043297	.043260	2.22
2.23	.041560	.042082	.042439	.042653	.042742	.042724	2.23
2.24	.040934	.041277	.041853	.042086	.042194	.042194	2.24
2.25	.040317	.040878	.041274	.041525	.041652	.041669	2.25
2.26	.039707	.040287	.040702	.040972	.041116	.041151	2.26
2.27	.039105	.039704	.040137	.040424	.040586	.040638	2.27
2.28	.038511	.039128	.039578	.039884	.040063	.040131	2.28
2.29	.037925	.038559	.039027	.039349	.039545	.039630	2.29
2.30	.037347	.037998	.038482	.038822	.039034	.039135	2.30
2.31	.036776	.037443	.037945	.038300	.038529	.038645	2.31
2.32	.036213	.036896	.037413	.037785	.038029	.038161	2.32
2.33	.035657	.036356	.036889	.037276	.037536	.037683	2.33
2.34	.035109	.035823	.036371	.036773	.037048	.037210	2.34
2.35	.034568	.035297	.035859	.036277	.036566	.036743	2.35
2.36	.034034	.034777	.035354	.035786	.036089	.036280	2.36
2.37	.033508	.034264	.034856	.035301	.035619	.035824	2.37
2.38	.032988	.033758	.034363	.034822	.035154	.035372	2.38
2.39	.032476	.033259	.033877	.034350	.034694	.034926	2.39
2.40	.031971	.032766	.033397	.033882	.034240	.034485	2.40
2.41	.031472	.032279	.032923	.033421	.033791	.034049	2.41
2.42	.030981	.031799	.032454	.032965	.033348	.033618	2.42
2.43	.030496	.031325	.031992	.032515	.032910	.033192	2.43
2.44	.030018	.030858	.031536	.032071	.032478	.032771	2.44
2.45	.029546	.030397	.031086	.031632	.032050	.032355	2.45
2.46	.029081	.029942	.030641	.031198	.031628	.031944	2.46
2.47	.028622	.029492	.030202	.030770	.031210	.031538	2.47
2.48	.028170	.029049	.029769	.030347	.030798	.031137	2.48
2.49	.027724	.028612	.029342	.029929	.030391	.030740	2.49

t	SKEWNESS .0	.1	.2	.3	.4	.5	t
2.50	.017528	.019768	.021741	.023461	.024944	.026212	2.50
2.51	.017095	.019324	.021293	.023012	.024499	.025772	2.51
2.52	.016670	.018888	.020852	.022571	.024060	.025338	2.52
2.53	.016254	.018461	.020420	.022137	.023629	.024911	2.53
2.54	.015848	.018043	.019995	.021711	.023204	.024490	2.54
2.55	.015449	.017632	.019578	.021292	.022785	.024075	2.55
2.56	.015060	.017230	.019168	.020879	.022374	.023666	2.56
2.57	.014678	.016835	.018766	.020474	.021968	.023264	2.57
2.58	.014305	.016448	.018371	.020075	.021570	.022867	2.58
2.59	.013940	.016068	.017983	.019684	.021177	.022477	2.59
2.60	.013583	.015697	.017603	.019298	.020791	.022093	2.60
2.61	.013234	.015332	.017229	.018920	.020411	.021714	2.61
2.62	.012892	.014975	.016862	.018548	.020038	.021341	2.62
2.63	.012558	.014625	.016502	.018182	.019670	.020974	2.63
2.64	.012232	.014282	.016149	.017823	.019308	.020612	2.64
2.65	.011912	.013946	.015802	.017470	.018952	.020256	2.65
2.66	.011600	.013617	.015462	.017123	.018602	.019905	2.66
2.67	.011295	.013295	.015128	.016782	.018257	.019560	2.67
2.68	.010997	.012979	.014800	.016447	.017919	.019220	2.68
2.69	.010706	.012670	.014479	.016118	.017585	.018886	2.69
2.70	.010421	.012367	.014163	.015795	.017258	.018556	2.70
2.71	.010143	.012071	.013854	.015477	.016935	.018232	2.71
2.72	.009871	.011780	.013551	.015165	.016619	.017913	2.72
2.73	.009606	.011496	.013253	.014859	.016307	.017599	2.73
2.74	.009347	.011218	.012961	.014558	.016000	.017289	2.74
2.75	.009094	.010945	.012675	.014262	.015699	.016985	2.75
2.76	.008847	.010679	.012395	.013972	.015403	.016685	2.76
2.77	.008605	.010418	.012120	.013687	.015112	.016391	2.77
2.78	.008370	.010163	.011850	.013408	.014825	.016100	2.78
2.79	.008140	.009913	.011586	.013133	.014544	.015815	2.79
2.80	.007915	.009669	.011326	.012863	.014267	.015534	2.80
2.81	.007697	.009430	.011072	.012598	.013995	.015258	2.81
2.82	.007483	.009196	.010823	.012338	.013728	.014986	2.82
2.83	.007274	.008967	.010579	.012083	.013465	.014718	2.83
2.84	.007071	.008743	.010340	.011833	.013206	.014455	2.84
2.85	.006873	.008524	.010106	.011587	.012953	.014195	2.85
2.86	.006679	.008310	.009876	.011346	.012703	.013941	2.86
2.87	.006491	.008101	.009651	.011109	.012458	.013690	2.87
2.88	.006307	.007897	.009431	.010877	.012217	.013443	2.88
2.89	.006127	.007697	.009215	.010649	.011981	.013201	2.89
2.90	.005953	.007501	.009003	.010425	.011748	.012962	2.90
2.91	.005782	.007310	.008796	.010206	.011519	.012727	2.91
2.92	.005616	.007123	.008593	.009990	.011295	.012496	2.92
2.93	.005454	.006941	.008394	.009779	.011075	.012269	2.93
2.94	.005296	.006763	.008199	.009572	.010858	.012046	2.94
2.95	.005143	.006588	.008009	.009368	.010645	.011826	2.95
2.96	.004993	.006418	.007822	.009169	.010436	.011610	2.96
2.97	.004847	.006252	.007639	.008974	.010231	.011398	2.97
2.98	.004705	.006089	.007460	.008782	.010029	.011189	2.98
2.99	.004567	.005930	.007285	.008594	.009831	.010984	2.99

t	SKEWNESS .6	.7	.8	.9	1.0	1.1	t
2.50	.027285	.028181	.028920	.029517	.029989	.030348	2.50
2.51	.026851	.027756	.028503	.029110	.029591	.029960	2.51
2.52	.026424	.027336	.028092	.028708	.029199	.029578	2.52
2.53	.026002	.026922	.027686	.028311	.028811	.029199	2.53
2.54	.025587	.026513	.027285	.027919	.028428	.028825	2.54
2.55	.025178	.026110	.026890	.027532	.028049	.028456	2.55
2.56	.024774	.025713	.026500	.027149	.027676	.028091	2.56
2.57	.024376	.025321	.026115	.026772	.027306	.027730	2.57
2.58	.023984	.024935	.025735	.026400	.026942	.027374	2.58
2.59	.023597	.024553	.025360	.026032	.026582	.027022	2.59
2.60	.023216	.024177	.024990	.025669	.026226	.026674	2.60
2.61	.022841	.023806	.024625	.025310	.025875	.026331	2.61
2.62	.022471	.023441	.024265	.024956	.025528	.025991	2.62
2.63	.022106	.023080	.023909	.024607	.025185	.025655	2.63
2.64	.021747	.022724	.023559	.024262	.024847	.025324	2.64
2.65	.021392	.022374	.023213	.023922	.024513	.024996	2.65
2.66	.021043	.022028	.022871	.023586	.024183	.024673	2.66
2.67	.020700	.021687	.022535	.023254	.023857	.024353	2.67
2.68	.020361	.021351	.022202	.022927	.023535	.024038	2.68
2.69	.020027	.021019	.021874	.022603	.023217	.023726	2.69
2.70	.019698	.020693	.021551	.022284	.022903	.023418	2.70
2.71	.019374	.020370	.021232	.021970	.022593	.023113	2.71
2.72	.019055	.020053	.020917	.021659	.022287	.022812	2.72
2.73	.018740	.019740	.020607	.021352	.021985	.022515	2.73
2.74	.018430	.019431	.020301	.021049	.021687	.022222	2.74
2.75	.018125	.019127	.019999	.020751	.021392	.021932	2.75
2.76	.017824	.018827	.019701	.020456	.021101	.021646	2.76
2.77	.017528	.018531	.019407	.020165	.020814	.021363	2.77
2.78	.017237	.018240	.019117	.019878	.020530	.021084	2.78
2.79	.016949	.017952	.018831	.019594	.020250	.020808	2.79
2.80	.016666	.017669	.018549	.019315	.019974	.020535	2.80
2.81	.016388	.017390	.018271	.019039	.019701	.020266	2.81
2.82	.016113	.017115	.017997	.018767	.019432	.020000	2.82
2.83	.015843	.016844	.017727	.018498	.019166	.019738	2.83
2.84	.015577	.016577	.017460	.018233	.018903	.019478	2.84
2.85	.015315	.016314	.017197	.017971	.018644	.019222	2.85
2.86	.015057	.016054	.016937	.017713	.018388	.018969	2.86
2.87	.014803	.015798	.016682	.017459	.018135	.018719	2.87
2.88	.014552	.015546	.016430	.017207	.017886	.018473	2.88
2.89	.014306	.015298	.016181	.016959	.017640	.018229	2.89
2.90	.014064	.015054	.015936	.016715	.017397	.017988	2.90
2.91	.013825	.014813	.015694	.016474	.017157	.017751	2.91
2.92	.013590	.014575	.015456	.016235	.016920	.017516	2.92
2.93	.013358	.014341	.015221	.016001	.016687	.017284	2.93
2.94	.013130	.014111	.014989	.015769	.016456	.017055	2.94
2.95	.012906	.013884	.014760	.015540	.016228	.016829	2.95
2.96	.012685	.013660	.014535	.015315	.016003	.016606	2.96
2.97	.012468	.013439	.014313	.015092	.015782	.016386	2.97
2.98	.012254	.013222	.014094	.014873	.015563	.016168	2.98
2.99	.012044	.013008	.013879	.014657	.015347	.015953	2.99

t	SKEWNESS						t
	.0	.1	.2	.3	.4	.5	
3.00	.004432	.005775	.007114	.008409	.009637	.010782	3.00
3.01	.004301	.005624	.006946	.008228	.009446	.010583	3.01
3.02	.004173	.005476	.006782	.008051	.009258	.010388	3.02
3.03	.004049	.005332	.006621	.007877	.009074	.010196	3.03
3.04	.003928	.005191	.006464	.007706	.008893	.010007	3.04
3.05	.003810	.005053	.006310	.007539	.008716	.009822	3.05
3.06	.003695	.004919	.006159	.007375	.008541	.009640	3.06
3.07	.003584	.004788	.006012	.007215	.008370	.009460	3.07
3.08	.003475	.004660	.005867	.007057	.008202	.009284	3.08
3.09	.003370	.004535	.005726	.006903	.008037	.009111	3.09
3.10	.003267	.004413	.005588	.006751	.007875	.008941	3.10
3.11	.003167	.004295	.005453	.006603	.007716	.008773	3.11
3.12	.003070	.004178	.005321	.006458	.007560	.008609	3.12
3.13	.002975	.004065	.005192	.006315	.007407	.008447	3.13
3.14	.002884	.003955	.005066	.006176	.007257	.008289	3.14
3.15	.002794	.003847	.004942	.006039	.007109	.008133	3.15
3.16	.002707	.003742	.004821	.005905	.006965	.007979	3.16
3.17	.002623	.003640	.004703	.005774	.006823	.007829	3.17
3.18	.002541	.003540	.004588	.005645	.006683	.007680	3.18
3.19	.002462	.003442	.004475	.005519	.006546	.007535	3.19
3.20	.002384	.003347	.004365	.005396	.006412	.007392	3.20
3.21	.002309	.003255	.004257	.005275	.006280	.007252	3.21
3.22	.002236	.003165	.004151	.005157	.006151	.007114	3.22
3.23	.002165	.003077	.004048	.005041	.006025	.006978	3.23
3.24	.002096	.002991	.003947	.004927	.005900	.006845	3.24
3.25	.002029	.002907	.003849	.004816	.005778	.006714	3.25
3.26	.001964	.002826	.003753	.004707	.005659	.006586	3.26
3.27	.001901	.002746	.003659	.004600	.005541	.006459	3.27
3.28	.001840	.002669	.003567	.004496	.005426	.006335	3.28
3.29	.001780	.002594	.003477	.004394	.005313	.006214	3.29
3.30	.001723	.002520	.003390	.004293	.005202	.006094	3.30
3.31	.001667	.002449	.003304	.004195	.005094	.005977	3.31
3.32	.001612	.002379	.003220	.004099	.004987	.005861	3.32
3.33	.001560	.002311	.003139	.004005	.004883	.005748	3.33
3.34	.001508	.002245	.003059	.003914	.004780	.005637	3.34
3.35	.001459	.002181	.002981	.003823	.004680	.005527	3.35
3.36	.001411	.002118	.002905	.003735	.004581	.005420	3.36
3.37	.001364	.002057	.002830	.003649	.004485	.005315	3.37
3.38	.001319	.001998	.002758	.003565	.004390	.005211	3.38
3.39	.001275	.001940	.002687	.003482	.004297	.005110	3.39
3.40	.001232	.001883	.002618	.003401	.004206	.005010	3.40
3.41	.001191	.001829	.002550	.003322	.004117	.004912	3.41
3.42	.001151	.001775	.002484	.003245	.004029	.004816	3.42
3.43	.001112	.001723	.002420	.003169	.003944	.004721	3.43
3.44	.001075	.001673	.002357	.003095	.003860	.004629	3.44
3.45	.001038	.001624	.002296	.003022	.003777	.004538	3.45
3.46	.001003	.001576	.002236	.002952	.003696	.004448	3.46
3.47	.000969	.001529	.002177	.002882	.003617	.004361	3.47
3.48	.000936	.001484	.002120	.002814	.003540	.004275	3.48
3.49	.000904	.001440	.002065	.002748	.003464	.004190	3.49

t	SKEWNESS .6	.7	.8	.9	1.0	1.1	t
3.00	.011836	.012798	.013666	.014443	.015133	.015741	3.00
3.01	.011632	.012590	.013456	.014233	.014923	.015531	3.01
3.02	.011432	.012386	.013249	.014025	.014715	.015324	3.02
3.03	.011234	.012184	.013046	.013820	.014510	.015120	3.03
3.04	.011040	.011986	.012845	.013618	.014308	.014918	3.04
3.05	.010848	.011791	.012647	.013418	.014108	.014719	3.05
3.06	.010660	.011598	.012452	.013222	.013911	.014523	3.06
3.07	.010475	.011409	.012259	.013028	.013717	.014328	3.07
3.08	.010293	.011222	.012070	.012837	.013525	.014137	3.08
3.09	.010113	.011038	.011883	.012648	.013335	.013947	3.09
3.10	.009937	.010857	.011699	.012462	.013148	.013761	3.10
3.11	.009763	.010679	.011517	.012279	.012964	.013576	3.11
3.12	.009592	.010503	.011339	.012098	.012782	.013394	3.12
3.13	.009424	.010330	.011162	.011919	.012603	.013214	3.13
3.14	.009259	.010160	.010989	.011743	.012425	.013037	3.14
3.15	.009096	.009992	.010817	.011570	.012251	.012861	3.15
3.16	.008936	.009827	.010649	.011399	.012078	.012688	3.16
3.17	.008779	.009665	.010483	.011230	.011908	.012517	3.17
3.18	.008624	.009505	.010319	.011064	.011740	.012349	3.18
3.19	.008472	.009347	.010157	.010900	.011574	.012182	3.19
3.20	.008322	.009192	.009998	.010738	.011411	.012018	3.20
3.21	.008174	.009039	.009842	.010578	.011250	.011856	3.21
3.22	.008029	.008889	.009687	.010421	.011090	.011696	3.22
3.23	.007887	.008741	.009535	.010266	.010933	.011538	3.23
3.24	.007747	.008595	.009385	.010113	.010778	.011381	3.24
3.25	.007609	.008452	.009237	.009962	.010626	.011227	3.25
3.26	.007473	.008311	.009092	.009814	.010475	.011075	3.26
3.27	.007340	.008172	.008949	.009667	.010326	.010925	3.27
3.28	.007208	.008035	.008807	.009523	.010179	.010777	3.28
3.29	.007080	.007900	.008668	.009380	.010035	.010631	3.29
3.30	.006953	.007767	.008531	.009240	.009892	.010486	3.30
3.31	.006828	.007637	.008396	.009101	.009751	.010344	3.31
3.32	.006705	.007508	.008263	.008965	.009612	.010203	3.32
3.33	.006585	.007382	.008132	.008830	.009475	.010065	3.33
3.34	.006466	.007257	.008003	.008698	.009340	.009927	3.34
3.35	.006350	.007135	.007876	.008567	.009206	.009792	3.35
3.36	.006235	.007014	.007750	.008438	.009075	.009659	3.36
3.37	.006122	.006896	.007627	.008311	.008945	.009527	3.37
3.38	.006011	.006779	.007506	.008186	.008817	.009397	3.38
3.39	.005903	.006664	.007386	.008062	.008690	.009269	3.39
3.40	.005796	.006551	.007268	.007941	.008566	.009142	3.40
3.41	.005690	.006440	.007152	.007821	.008443	.009017	3.41
3.42	.005587	.006330	.007037	.007702	.008322	.008894	3.42
3.43	.005485	.006222	.006925	.007586	.008202	.008772	3.43
3.44	.005385	.006116	.006814	.007471	.008084	.008652	3.44
3.45	.005287	.006012	.006704	.007358	.007968	.008533	3.45
3.46	.005190	.005909	.006597	.007246	.007853	.008416	3.46
3.47	.005095	.005808	.006491	.007136	.007740	.008301	3.47
3.48	.005002	.005709	.006386	.007028	.007629	.008187	3.48
3.49	.004910	.005611	.006284	.006921	.007519	.008074	3.49

t	SKEWNESS						t
	.0	.1	.2	.3	.4	.5	
3.50	.000873	.001397	.002010	.002683	.003389	.004107	3.50
3.51	.000843	.001356	.001957	.002619	.003316	.004026	3.51
3.52	.000814	.001315	.001906	.002557	.003245	.003946	3.52
3.53	.000785	.001276	.001855	.002497	.003174	.003868	3.53
3.54	.000758	.001238	.001806	.002437	.003106	.003791	3.54
3.55	.000732	.001200	.001758	.002379	.003038	.003715	3.55
3.56	.000706	.001164	.001711	.002322	.002972	.003641	3.56
3.57	.000681	.001129	.001666	.002267	.002908	.003568	3.57
3.58	.000657	.001095	.001621	.002212	.002845	.003497	3.58
3.59	.000634	.001062	.001578	.002159	.002782	.003427	3.59
3.60	.000612	.001029	.001536	.002107	.002722	.003358	3.60
3.61	.000590	.000998	.001494	.002057	.002662	.003291	3.61
3.62	.000569	.000967	.001454	.002007	.002604	.003225	3.62
3.63	.000549	.000938	.001415	.001959	.002547	.003160	3.63
3.64	.000529	.000909	.001377	.001911	.002491	.003096	3.64
3.65	.000510	.000881	.001339	.001865	.002436	.003034	3.65
3.66	.000492	.000854	.001303	.001820	.002382	.002972	3.66
3.67	.000474	.000827	.001268	.001775	.002330	.002912	3.67
3.68	.000457	.000802	.001233	.001732	.002278	.002853	3.68
3.69	.000441	.000777	.001200	.001690	.002228	.002795	3.69
3.70	.000425	.000753	.001167	.001649	.002179	.002739	3.70
3.71	.000409	.000729	.001135	.001608	.002130	.002683	3.71
3.72	.000394	.000706	.001104	.001569	.002083	.002628	3.72
3.73	.000380	.000684	.001073	.001530	.002037	.002575	3.73
3.74	.000366	.000663	.001044	.001493	.001991	.002522	3.74
3.75	.000353	.000642	.001015	.001456	.001947	.002471	3.75
3.76	.000340	.000622	.000987	.001420	.001903	.002420	3.76
3.77	.000327	.000602	.000960	.001385	.001861	.002371	3.77
3.78	.000315	.000583	.000933	.001351	.001819	.002322	3.78
3.79	.000303	.000565	.000907	.001317	.001778	.002275	3.79
3.80	.000292	.000547	.000882	.001284	.001738	.002228	3.80
3.81	.000281	.000529	.000857	.001253	.001699	.002182	3.81
3.82	.000271	.000512	.000833	.001221	.001661	.002137	3.82
3.83	.000260	.000496	.000810	.001191	.001624	.002093	3.83
3.84	.000251	.000480	.000787	.001161	.001587	.002050	3.84
3.85	.000241	.000465	.000765	.001132	.001551	.002008	3.85
3.86	.000232	.000450	.000744	.001104	.001516	.001966	3.86
3.87	.000223	.000435	.000723	.001076	.001482	.001925	3.87
3.88	.000215	.000421	.000702	.001049	.001448	.001885	3.88
3.89	.000207	.000407	.000682	.001023	.001415	.001846	3.89
3.90	.000199	.000394	.000663	.000997	.001383	.001808	3.90
3.91	.000191	.000381	.000644	.000972	.001351	.001770	3.91
3.92	.000184	.000369	.000626	.000947	.001321	.001733	3.92
3.93	.000177	.000357	.000608	.000923	.001290	.001697	3.93
3.94	.000170	.000345	.000591	.000900	.001261	.001662	3.94
3.95	.000163	.000334	.000574	.000877	.001232	.001627	3.95
3.96	.000157	.000323	.000557	.000855	.001204	.001593	3.96
3.97	.000151	.000312	.000541	.000833	.001176	.001560	3.97
3.98	.000144	.000302	.000526	.000811	.001149	.001527	3.98
3.99	.000139	.000292	.000511	.000791	.001123	.001495	3.99

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
3.50	.004820	.005515	.006182	.006815	.007410	.007963	3.50
3.51	.004732	.005420	.006083	.006712	.007303	.007854	3.51
3.52	.004645	.005327	.005985	.006609	.007197	.007746	3.52
3.53	.004559	.005236	.005888	.006509	.007093	.007639	3.53
3.54	.004475	.005146	.005793	.006409	.006991	.007534	3.54
3.55	.004392	.005057	.005699	.006311	.006889	.007430	3.55
3.56	.004311	.004970	.005607	.006215	.006790	.007327	3.56
3.57	.004231	.004884	.005516	.006120	.006691	.007226	3.57
3.58	.004153	.004799	.005426	.006026	.006594	.007126	3.58
3.59	.004076	.004716	.005338	.005934	.006498	.007028	3.59
3.60	.004000	.004635	.005251	.005843	.006404	.006931	3.60
3.61	.003926	.004554	.005166	.005753	.006311	.006835	3.61
3.62	.003853	.004475	.005082	.005665	.006219	.006740	3.62
3.63	.003781	.004398	.004999	.005578	.006128	.006647	3.63
3.64	.003711	.004321	.004917	.005492	.006039	.006555	3.64
3.65	.003641	.004246	.004837	.005407	.005951	.006464	3.65
3.66	.003573	.004172	.004758	.005324	.005864	.006374	3.66
3.67	.003506	.004099	.004680	.005242	.005779	.006286	3.67
3.68	.003441	.004028	.004604	.005161	.005694	.006199	3.68
3.69	.003376	.003957	.004528	.005082	.005611	.006112	3.69
3.70	.003313	.003888	.004454	.005003	.005529	.006027	3.70
3.71	.003251	.003820	.004381	.004926	.005448	.005944	3.71
3.72	.003190	.003753	.004309	.004850	.005368	.005861	3.72
3.73	.003129	.003687	.004238	.004774	.005290	.005779	3.73
3.74	.003070	.003623	.004169	.004701	.005212	.005699	3.74
3.75	.003013	.003559	.004100	.004628	.005136	.005619	3.75
3.76	.002956	.003497	.004033	.004556	.005060	.005541	3.76
3.77	.002900	.003435	.003966	.004485	.004986	.005464	3.77
3.78	.002845	.003374	.003901	.004415	.004913	.005387	3.78
3.79	.002791	.003315	.003836	.004347	.004840	.005312	3.79
3.80	.002738	.003256	.003773	.004279	.004769	.005238	3.80
3.81	.002686	.003199	.003711	.004213	.004699	.005165	3.81
3.82	.002635	.003142	.003649	.004147	.004630	.005092	3.82
3.83	.002585	.003087	.003589	.004082	.004561	.005021	3.83
3.84	.002536	.003032	.003529	.004019	.004494	.004951	3.84
3.85	.002487	.002978	.003471	.003956	.004428	.004881	3.85
3.86	.002440	.002926	.003413	.003894	.004362	.004813	3.86
3.87	.002393	.002874	.003356	.003833	.004298	.004745	3.87
3.88	.002347	.002823	.003301	.003773	.004234	.004679	3.88
3.89	.002303	.002772	.003246	.003714	.004172	.004613	3.89
3.90	.002258	.002723	.003192	.003656	.004110	.004548	3.90
3.91	.002215	.002674	.003138	.003599	.004049	.004484	3.91
3.92	.002173	.002627	.003086	.003542	.003989	.004421	3.92
3.93	.002131	.002580	.003035	.003487	.003930	.004359	3.93
3.94	.002090	.002534	.002984	.003432	.003872	.004298	3.94
3.95	.002050	.002489	.002934	.003378	.003814	.004237	3.95
3.96	.002010	.002444	.002885	.003325	.003758	.004178	3.96
3.97	.001971	.002400	.002837	.003273	.003702	.004119	3.97
3.98	.001933	.002357	.002789	.003221	.003647	.004061	3.98
3.99	.001896	.002315	.002742	.003170	.003593	.004003	3.99

t	SKEWNESS						t
	.0	.1	.2	.3	.4	.5	
4.00	.000134	.000282	.000496	.000771	.001097	.001463	4.00
4.01	.000129	.000273	.000482	.000751	.001071	.001433	4.01
4.02	.000124	.000264	.000468	.000732	.001047	.001403	4.02
4.03	.000119	.000255	.000454	.000713	.001022	.001373	4.03
4.04	.000114	.000246	.000441	.000694	.000999	.001344	4.04
4.05	.000109	.000238	.000428	.000676	.000976	.001316	4.05
4.06	.000105	.000230	.000416	.000659	.000953	.001288	4.06
4.07	.000101	.000222	.000404	.000642	.000931	.001260	4.07
4.08	.000097	.000215	.000392	.000625	.000909	.001234	4.08
4.09	.000093	.000208	.000380	.000609	.000888	.001208	4.09
4.10	.000089	.000201	.000369	.000593	.000867	.001182	4.10
4.11	.000086	.000194	.000358	.000578	.000847	.001157	4.11
4.12	.000082	.000187	.000348	.000563	.000827	.001132	4.12
4.13	.000079	.000181	.000337	.000548	.000808	.001108	4.13
4.14	.000076	.000175	.000328	.000534	.000789	.001084	4.14
4.15	.000073	.000169	.000318	.000520	.000770	.001061	4.15
4.16	.000070	.000163	.000308	.000506	.000752	.001039	4.16
4.17	.000067	.000157	.000299	.000493	.000735	.001016	4.17
4.18	.000064	.000152	.000290	.000480	.000717	.000995	4.18
4.19	.000062	.000147	.000282	.000468	.000700	.000973	4.19
4.20	.000059	.000142	.000273	.000455	.000684	.000952	4.20
4.21	.000057	.000137	.000265	.000443	.000668	.000932	4.21
4.22	.000054	.000132	.000257	.000432	.000652	.000912	4.22
4.23	.000052	.000128	.000250	.000420	.000636	.000892	4.23
4.24	.000050	.000123	.000242	.000409	.000621	.000873	4.24
4.25	.000048	.000119	.000235	.000398	.000606	.000854	4.25
4.26	.000046	.000115	.000228	.000388	.000592	.000836	4.26
4.27	.000044	.000111	.000221	.000377	.000578	.000818	4.27
4.28	.000042	.000107	.000214	.000367	.000564	.000800	4.28
4.29	.000040	.000103	.000208	.000357	.000551	.000783	4.29
4.30	.000039	.000099	.000201	.000348	.000538	.000766	4.30
4.31	.000037	.000096	.000195	.000339	.000525	.000749	4.31
4.32	.000035	.000093	.000189	.000330	.000512	.000733	4.32
4.33	.000034	.000089	.000184	.000321	.000500	.000717	4.33
4.34	.000032	.000086	.000178	.000312	.000488	.000701	4.34
4.35	.000031	.000083	.000173	.000304	.000476	.000686	4.35
4.36	.000030	.000080	.000167	.000296	.000465	.000671	4.36
4.37	.000028	.000077	.000162	.000288	.000454	.000656	4.37
4.38	.000027	.000074	.000157	.000280	.000443	.000642	4.38
4.39	.000026	.000072	.000152	.000272	.000432	.000628	4.39
4.40	.000025	.000069	.000148	.000265	.000421	.000614	4.40
4.41	.000024	.000067	.000143	.000258	.000411	.000601	4.41
4.42	.000023	.000064	.000139	.000251	.000401	.000588	4.42
4.43	.000022	.000062	.000134	.000244	.000392	.000575	4.43
4.44	.000021	.000060	.000130	.000237	.000382	.000562	4.44
4.45	.000020	.000058	.000126	.000231	.000373	.000550	4.45
4.46	.000019	.000056	.000122	.000225	.000364	.000538	4.46
4.47	.000018	.000054	.000119	.000219	.000355	.000526	4.47
4.48	.000018	.000052	.000115	.000213	.000346	.000514	4.48
4.49	.000017	.000050	.000111	.000207	.000338	.000503	4.49

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
4.00	.001859	.002273	.002696	.003121	.03539	.003947	4.00
4.01	.001823	.002233	.002651	.003071	.003486	.003891	4.01
4.02	.001788	.002192	.002607	.003023	.003434	.003836	4.02
4.03	.001753	.002153	.002563	.002975	.003383	.003782	4.03
4.04	.001719	.002114	.002520	.002928	.003333	.003728	4.04
4.05	.001686	.002076	.002477	.002882	.003283	.003676	4.05
4.06	.001653	.002039	.002436	.002836	.003234	.003624	4.06
4.07	.001621	.002002	.002394	.002791	.003186	.003572	4.07
4.08	.001589	.001966	.002354	.002747	.003138	.003522	4.08
4.09	.001558	.001930	.002314	.002704	.003091	.003472	4.09
4.10	.001528	.001895	.002275	.002661	.003045	.003423	4.10
4.11	.001498	.001861	.002237	.002618	.002999	.003374	4.11
4.12	.001469	.001827	.002199	.002577	.002954	.003326	4.12
4.13	.001440	.001794	.002162	.002536	.002910	.003279	4.13
4.14	.001412	.001761	.002125	.002496	.002866	.003232	4.14
4.15	.001384	.001729	.002089	.002456	.002823	.003186	4.15
4.16	.001357	.001698	.002054	.002417	.002781	.003141	4.16
4.17	.001330	.001667	.002019	.002378	.002739	.003096	4.17
4.18	.001304	.001637	.001984	.002340	.002698	.003052	4.18
4.19	.001278	.001607	.001951	.002303	.002658	.003009	4.19
4.20	.001253	.001577	.001918	.002266	.002618	.002966	4.20
4.21	.001228	.001549	.001885	.002230	.002578	.002924	4.21
4.22	.001204	.001520	.001853	.002194	.002539	.002882	4.22
4.23	.001180	.001492	.001821	.002159	.002501	.002841	4.23
4.24	.001157	.001465	.001790	.002125	.002463	.002800	4.24
4.25	.001134	.001438	.001760	.002091	.002426	.002760	4.25
4.26	.001112	.001412	.001730	.002057	.002390	.002721	4.26
4.27	.001090	.001386	.001700	.002024	.002354	.002682	4.27
4.28	.001068	.001361	.001671	.001992	.002318	.002644	4.28
4.29	.001047	.001336	.001642	.001960	.002283	.002606	4.29
4.30	.001026	.001311	.001614	.001929	.002248	.002569	4.30
4.31	.001005	.001287	.001586	.001898	.002214	.002532	4.31
4.32	.000985	.001263	.001559	.001867	.002181	.002496	4.32
4.33	.000966	.001240	.001533	.001837	.002148	.002460	4.33
4.34	.000947	.001217	.001506	.001808	.002115	.002425	4.34
4.35	.000928	.001195	.001480	.001778	.002083	.002390	4.35
4.36	.000909	.001173	.001455	.001750	.002052	.002356	4.36
4.37	.000891	.001151	.001430	.001722	.002021	.002322	4.37
4.38	.000873	.001130	.001405	.001694	.001990	.002289	4.38
4.39	.000856	.001109	.001381	.001667	.001960	.002256	4.39
4.40	.000838	.001088	.001357	.001640	.001930	.002223	4.40
4.41	.000822	.001068	.001334	.001613	.001901	.002191	4.41
4.42	.000805	.001048	.001311	.001587	.001872	.002160	4.42
4.43	.000789	.001029	.001288	.001561	.001843	.002129	4.43
4.44	.000773	.001010	.001266	.001536	.001815	.002098	4.44
4.45	.000758	.000991	.001244	.001511	.001788	.002068	4.45
4.46	.000742	.000972	.001223	.001487	.001760	.002038	4.46
4.47	.000727	.000954	.001201	.001463	.001733	.002009	4.47
4.48	.000713	.000937	.001181	.001439	.001707	.001980	4.48
4.49	.000698	.000919	.001160	.001416	.001681	.001951	4.49

t	SKEWNESS						t
	.0	.1	.2	.3	.4	.5	
4.50	.000016	.000048	.000108	.000201	.000330	.000492	4.50
4.51	.000015	.000046	.000104	.000196	.000321	.000481	4.51
4.52	.000015	.000044	.000101	.000190	.000314	.000470	4.52
4.53	.000014	.000043	.000098	.000185	.000306	.000460	4.53
4.54	.000013	.000041	.000095	.000180	.000298	.000450	4.54
4.55	.000013	.000040	.000092	.000175	.000291	.000440	4.55
4.56	.000012	.000038	.000089	.000170	.000284	.000430	4.56
4.57	.000012	.000037	.000086	.000165	.000277	.000420	4.57
4.58	.000011	.000036	.000084	.000161	.000270	.000411	4.58
4.59	.000011	.000034	.000081	.000156	.000263	.000402	4.59
4.60	.000010	.000033	.000078	.000152	.000257	.000393	4.60
4.61	.000010	.000032	.000076	.000148	.000251	.000384	4.61
4.62	.000009	.000031	.000073	.000144	.000244	.000375	4.62
4.63	.000009	.000029	.000071	.000140	.000238	.000367	4.63
4.64	.000008	.000028	.000069	.000136	.000232	.000359	4.64
4.65	.000008	.000027	.000067	.000132	.000227	.000351	4.65
4.66	.000008	.000026	.000065	.000128	.000221	.000343	4.66
4.67	.000007	.000025	.000062	.000125	.000216	.000335	4.67
4.68	.000007	.000024	.000060	.000121	.000210	.000328	4.68
4.69	.000007	.000023	.000059	.000118	.000205	.000320	4.69
4.70	.000006	.000023	.000057	.000115	.000200	.000313	4.70
4.71	.000006	.000022	.000055	.000111	.000195	.000306	4.71
4.72	.000006	.000021	.000053	.000108	.000190	.000299	4.72
4.73	.000006	.000020	.000051	.000105	.000185	.000292	4.73
4.74	.000005	.000019	.000050	.000102	.000181	.000286	4.74
4.75	.000005	.000019	.000048	.000099	.000176	.000279	4.75
4.76	.000005	.000018	.000047	.000097	.000172	.000273	4.76
4.77	.000005	.000017	.000045	.000094	.000167	.000267	4.77
4.78	.000004	.000017	.000044	.000091	.000163	.000261	.478
4.79	.000004	.000016	.000042	.000089	.000159	.000255	4.79
4.80	.000004	.000015	.000041	.000086	.000155	.000249	4.80
4.81	.000004	.000015	.000039	.000084	.000151	.000244	4.81
4.82	.000004	.000014	.000038	.000081	.000147	.000238	4.82
4.83	.000003	.000014	.000037	.000079	.000144	.000233	4.83
4.84	.000003	.000013	.000036	.000077	.000140	.000227	4.84
4.85	.000003	.000013	.000035	.000075	.000136	.000222	4.85
4.86	.000003	.000012	.000033	.000072	.000133	.000217	4.86
4.87	.000003	.000012	.000032	.000070	.000130	.000212	4.87
4.88	.000003	.000011	.000031	.000068	.000126	.000207	4.88
4.89	.000003	.000011	.000030	.000066	.000123	.000203	4.89
4.90	.000002	.000010	.000029	.000064	.000120	.000198	4.90
4.91	.000002	.000010	.000028	.000063	.000117	.000193	4.91
4.92	.000002	.000010	.000027	.000061	.000114	.000189	4.92
4.93	.000002	.000009	.000026	.000059	.000111	.000185	4.93
4.94	.000002	.000009	.000026	.000057	.000108	.000180	4.94
4.95	.000002	.000008	.000025	.000056	.000105	.000176	4.95
4.96	.000002	.000008	.000024	.000054	.000103	.000172	4.96
4.97	.000002	.000008	.000023	.000053	.000100	.000168	4.97
4.98	.000002	.000007	.000022	.000051	.000098	.000164	4.98
4.99	.000002	.000007	.000022	.000050	.000095	.000161	4.99

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
4.50	.000684	.000902	.001140	.001393	.001655	.001923	4.50
4.51	.000670	.000885	.001120	.001370	.001630	.001895	4.51
4.52	.000657	.000869	.001101	.001348	.001605	.001868	4.52
4.53	.000643	.000852	.001082	.001326	.001581	.001841	4.53
4.54	.000630	.000836	.001063	.001304	.001556	.001814	4.54
4.55	.000618	.000821	.001044	.001283	.001533	.001788	4.55
4.56	.000605	.000805	.001026	.001262	.001509	.001762	4.56
4.57	.000593	.000790	.001008	.001242	.001486	.001737	4.57
4.58	.000581	.000775	.000991	.001222	.001463	.001712	4.58
4.59	.000569	.000761	.000973	.001202	.001441	.001687	4.59
4.60	.000557	.000747	.000956	.001182	.001419	.001663	4.60
4.61	.000546	.000733	.000940	.001163	.001397	.001638	4.61
4.62	.000535	.000719	.000923	.001144	.001376	.001615	4.62
4.63	.000524	.000705	.000907	.001125	.001354	.001591	4.63
4.64	.000513	.000692	.000891	.001107	.001334	.001568	4.64
4.65	.000503	.000679	.000876	.001089	.001313	.001545	4.65
4.66	.000492	.000666	.000860	.001071	.001293	.001523	4.66
4.67	.000482	.000654	.000845	.001053	.001273	.001501	4.67
4.68	.000472	.000641	.000831	.001036	.001253	.001479	4.68
4.69	.000463	.000629	.000816	.001019	.001234	.001458	4.69
4.70	.000453	.000617	.000802	.001002	.001215	.001436	4.70
4.71	.000444	.000606	.000788	.000986	.001196	.001416	4.71
4.72	.000435	.000594	.000774	.000970	.001178	.001395	4.72
4.73	.000426	.000583	.000760	.000954	.001160	.001375	4.73
4.74	.000417	.000572	.000747	.000938	.001142	.001355	4.74
4.75	.000408	.000561	.000734	.000923	.001124	.001335	4.75
4.76	.000400	.000550	.000721	.000908	.001107	.001315	4.76
4.77	.000392	.000540	.000708	.000893	.001090	.001296	4.77
4.78	.000384	.000530	.000696	.000878	.001073	.001277	4.78
4.79	.000376	.000520	.000683	.000863	.001056	.001259	4.79
4.80	.000368	.000510	.000671	.000849	.001040	.001240	4.80
4.81	.000360	.000500	.000659	.000835	.001024	.001222	4.81
4.82	.000353	.000490	.000648	.000821	.001008	.001204	4.82
4.83	.000346	.000481	.000636	.000808	.000993	.001187	4.83
4.84	.000338	.000472	.000625	.000795	.000977	.001170	4.84
4.85	.000331	.000463	.000614	.000781	.000962	.001152	4.85
4.86	.000325	.000454	.000603	.000769	.000947	.001136	4.86
4.87	.000318	.000445	.000592	.000756	.000932	.001119	4.87
4.88	.000311	.000437	.000582	.000743	.000918	.001103	4.88
4.89	.000305	.000429	.000572	.000731	.000904	.001086	4.89
4.90	.000298	.000420	.000561	.000719	.000890	.001071	4.90
4.91	.000292	.000412	.000551	.000707	.000876	.001055	4.91
4.92	.000286	.000404	.000542	.000695	.000862	.001039	4.92
4.93	.000280	.000397	.000532	.000684	.000849	.001024	4.93
4.94	.000274	.000389	.000523	.000672	.000836	.001009	4.94
4.95	.000269	.000382	.000513	.000661	.000823	.000994	4.95
4.96	.000263	.000374	.000504	.000650	.000810	.000980	4.96
4.97	.000257	.000367	.000495	.000640	.000797	.000965	4.97
4.98	.000252	.000360	.000486	.000629	.000785	.000951	4.98
4.99	.000247	.000353	.000478	.000618	.000773	.000937	4.99

t	SKEWNESS						t
	.0	.1	.2	.3	.4	.5	
5.00	.000001	.000007	.000021	.000048	.000093	.000157	5.00
5.01	.000001	.000007	.000020	.000047	.000090	.000153	5.01
5.02	.000001	.000006	.000019	.000045	.000088	.000150	5.02
5.03	.000001	.000006	.000019	.000044	.000086	.000146	5.03
5.04	.000001	.000006	.000018	.000043	.000083	.000143	5.04
5.05	.000001	.000006	.000018	.000042	.000081	.000140	5.05
5.06	.000001	.000005	.000017	.000040	.000079	.000136	5.06
5.07	.000001	.000005	.000016	.000039	.000077	.000133	5.07
5.08	.000001	.000005	.000016	.000038	.000075	.000130	5.08
5.09	.000001	.000005	.000015	.000037	.000073	.000127	5.09
5.10	.000001	.000005	.000015	.000036	.000071	.000124	5.10
5.11	.000001	.000004	.000014	.000035	.000070	.000121	5.11
5.12	.000001	.000004	.000014	.000034	.000068	.000118	5.12
5.13	.000001	.000004	.000013	.000033	.000066	.000116	5.13
5.14	.000001	.000004	.000013	.000032	.000064	.000113	5.14
5.15	.000001	.000004	.000012	.000031	.000063	.000110	5.15
5.16	.000001	.000004	.000012	.000030	.000061	.000108	5.16
5.17	.000001	.000003	.000012	.000029	.000059	.000105	5.17
5.18	.000001	.000003	.000011	.000028	.000058	.000103	5.18
5.19	.000001	.000003	.000011	.000027	.000056	.000100	5.19
5.20	.000001	.000003	.000010	.000027	.000055	.000098	5.20
5.21	.000001	.000003	.000010	.000026	.000053	.000096	5.21
5.22		.000003	.000010	.000025	.000052	.000093	5.22
5.23		.000003	.000009	.000024	.000051	.000091	5.23
5.24		.000003	.000009	.000024	.000049	.000089	5.24
5.25		.000002	.000009	.000023	.000048	.000087	5.25
5.26		.000002	.000008	.000022	.000047	.000085	5.26
5.27		.000002	.000008	.000021	.000046	.000083	5.27
5.28		.000002	.000008	.000021	.000044	.000081	5.28
5.29		.000002	.000008	.000020	.000043	.000079	5.29
5.30		.000002	.000007	.000020	.000042	.000077	5.30
5.31		.000002	.000007	.000019	.000041	.000075	5.31
5.32		.000002	.000007	.000018	.000040	.000074	5.32
5.33		.000002	.000007	.000018	.000039	.000072	5.33
5.34		.000002	.000006	.000017	.000038	.000070	5.34
5.35		.000002	.000006	.000017	.000037	.000069	5.35
5.36		.000002	.000006	.000016	.000036	.000067	5.36
5.37		.000001	.000006	.000016	.000035	.000065	5.37
5.38		.000001	.000006	.000015	.000034	.000064	5.38
5.39		.000001	.000005	.000015	.000033	.000062	5.39
5.40		.000001	.000005	.000014	.000032	.000061	5.40
5.41		.000001	.000005	.000014	.000031	.000059	5.41
5.42		.000001	.000005	.000014	.000030	.000058	5.42
5.43		.000001	.000005	.000013	.000030	.000056	5.43
5.44		.000001	.000004	.000013	.000029	.000055	5.44
5.45		.000001	.000004	.000012	.000028	.000054	5.45
5.46		.000001	.000004	.000012	.000027	.000053	5.46
5.47		.000001	.000004	.000012	.000027	.000051	5.47
5.48		.000001	.000004	.000011	.000026	.000050	5.48
5.49		.000001	.000004	.000011	.000025	.000049	5.49

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
5.00	.000242	.000346	.000469	.000608	.000761	.000924	5.00
5.01	.000236	.000340	.000461	.000598	.000749	.000910	5.01
5.02	.000232	.000333	.000453	.000588	.000737	.000897	5.02
5.03	.000227	.000327	.000444	.000578	.000726	.000883	5.03
5.04	.000222	.000320	.000437	.000569	.000714	.000870	5.04
5.05	.000217	.000314	.000429	.000559	.000703	.000857	5.05
5.06	.000213	.000308	.000421	.000550	.000692	.000845	5.06
5.07	.000208	.000302	.000414	.000541	.000681	.000833	5.07
5.08	.000204	.000296	.000406	.000532	.000671	.000820	5.08
5.09	.000199	.000290	.000399	.000523	.000660	.000808	5.09
5.10	.000195	.000285	.000392	.000514	.000650	.000796	5.10
5.11	.000191	.000279	.000385	.000506	.000640	.000785	5.11
5.12	.000187	.000274	.000378	.000497	.000630	.000773	5.12
5.13	.000183	.000269	.000371	.000489	.000620	.000762	5.13
5.14	.000179	.000263	.000364	.000481	.000610	.000750	5.14
5.15	.000175	.000258	.000358	.000473	.000600	.000739	5.15
5.16	.000172	.000253	.000351	.000465	.000591	.000728	5.16
5.17	.000168	.000248	.000345	.000457	.000582	.000718	5.17
5.18	.000165	.000243	.000339	.000449	.000573	.000707	5.18
5.19	.000161	.000239	.000333	.000442	.000564	.000697	5.19
5.20	.000158	.000234	.000327	.000434	.000555	.000686	5.20
5.21	.000154	.000230	.000321	.000427	.000546	.000676	5.21
5.22	.000151	.000225	.000315	.000420	.000537	.000666	5.22
5.23	.000148	.000221	.000309	.000413	.000529	.000656	5.23
5.24	.000145	.000216	.000304	.000406	.000521	.000647	5.24
5.25	.000142	.000212	.000298	.000399	.000513	.000637	5.25
5.26	.000139	.000208	.000293	.000392	.000504	.000628	5.26
5.27	.000136	.000204	.000288	.000386	.000497	.000618	5.27
5.28	.000133	.000200	.000282	.000379	.000489	.000609	5.28
5.29	.000130	.000196	.000277	.000373	.000481	.000600	5.29
5.30	.000127	.000192	.000272	.000367	.000473	.000591	5.30
5.31	.000124	.000188	.000267	.000360	.000466	.000582	5.31
5.32	.000122	.000185	.000263	.000354	.000459	.000574	5.32
5.33	.000119	.000181	.000258	.000348	.000451	.000565	5.33
5.34	.000117	.000178	.000253	.000342	.000444	.000557	5.34
5.35	.000114	.000174	.000248	.000337	.000437	.000549	5.35
5.36	.000112	.000171	.000244	.000331	.000430	.000540	5.36
5.37	.000109	.000167	.000240	.000325	.000424	.000532	5.37
5.38	.000107	.000164	.000235	.000320	.000417	.000524	5.38
5.39	.000105	.000161	.000231	.000314	.000410	.000517	5.39
5.40	.000102	.000158	.000227	.000309	.000404	.000509	5.40
5.41	.000100	.000154	.000223	.000304	.000397	.000501	5.41
5.42	.000098	.000151	.000219	.000299	.000391	.000494	5.42
5.43	.000096	.000148	.000215	.000294	.000385	.000487	5.43
5.44	.000094	.000146	.000211	.000289	.000379	.000479	5.44
5.45	.000092	.000143	.000207	.000284	.000373	.000472	5.45
5.46	.000090	.000140	.000203	.000279	.000367	.000465	5.46
5.47	.000088	.000137	.000199	.000274	.000361	.000458	5.47
5.48	.000086	.000134	.000196	.000270	.000355	.000451	5.48
5.49	.000084	.000132	.000192	.000265	.000350	.000445	5.49

t	SKEWNESS						t
	.0	.1	.2	.3	.4	.5	
5.50		.000001	.000004	.000011	.000025	.000048	5.50
5.51		.000001	.000003	.000010	.000024	.000047	5.51
5.52		.000001	.000003	.000010	.000023	.000046	5.52
5.53		.000001	.000003	.000010	.000023	.000044	5.53
5.54		.000001	.000003	.000009	.000022	.000043	5.54
5.55		.000001	.000003	.000009	.000021	.000042	5.55
5.56		.000001	.000003	.000009	.000021	.000041	5.56
5.57		.000001	.000003	.000009	.000020	.000040	5.57
5.58		.000001	.000003	.000008	.000020	.000039	5.58
5.59		.000001	.000003	.000008	.000019	.000038	5.59
5.60		000001	.000003	.000008	.000019	.000037	5.60
5.61		.000001	.000002	.000008	.000018	.000037	5.61
5.62			.000002	.000007	.000018	.000036	5.62
5.63			.000002	.000007	.000017	.000035	5.63
5.64			.000002	.000007	.000017	.000034	5.64
5.65			000002	.000007	.000016	.000033	5.65
5.66			.000002	.000006	.000016	.000032	5.66
5.67			.000002	.000006	.000015	.000032	5.67
5.68			000002	.000006	.000015	.000031	5.68
5.69			.000002	.000006	.000015	.000030	5.69
5.70			.000002	.000006	.000014	.000029	5.70
5.71			.000002	.000006	.000014	.000029	5.71
5.72			.000002	.000005	000013	.000028	5.72
5.73			.000002	.000005	.000013	.000027	5.73
5.74			.000001	.000005	000013	.000027	5.74
5.75			.000001	.000005	.000012	.000026	5.75
5.76			.000001	.000005	.000012	.000025	5.76
5.77			.000001	.000005	.000012	.000025	5.77
5.78			.000001	.000004	.000011	.000024	5.78
5.79			.000001	.000004	.000011	.000024	5.79
5.80			.000001	.000004	.000011	.000023	5.80
5.81			.000001	.000004	.000010	.000022	5.81
5.82			.000001	.000004	.000010	.000022	5.82
5.83			.000001	.000004	.000010	.000021	5.83
5.84			.000001	.000004	.000010	.000021	5.84
5.85			.000001	.000004	.000009	.000020	5.85
5.86			.000001	.000003	.000009	.000020	5.86
5.87			.000001	.000003	.000009	.000019	5.87
5.88			.000001	.000003	.000009	.000019	5.88
5.89			.000001	.000003	.000008	.000018	5.89
5.90			.000001	.000003	.000008	.000018	5.90
5.91			.000001	.000003	.000008	.000017	5.91
5.92			.000001	.000003	000008	.000017	5.92
5.93			000001	.000003	.000007	.000017	5.93
5.94			.000001	.000003	.000007	.000016	5.94
5.95			.000001	.000003	.000007	.000016	5.95
5.96			.000001	.000002	.000007	.000015	5.96
5.97			.000001	.000002	.000007	.000015	5.97
5.98			.000001	.000002	.000007	.000015	5.98
5.99			.000001	.000002	.000006	.000014	5.99

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
5.50	.000082	.000129	.000189	.000261	.000344	.000438	5.50
5.51	.000080	.000127	.000185	.000256	.000339	.000432	5.51
5.52	.000079	.000124	.000182	.000252	.000333	.000425	5.52
5.53	.000077	.000122	.000178	.000248	.000328	.000419	5.53
5.54	.000075	.000119	.000175	.000243	.000323	.000412	5.54
5.55	.000074	.000117	.000172	.000239	.000318	.000406	5.55
5.56	.000072	.000114	.000169	.000235	.000313	.000400	5.56
5.57	.000071	.000112	.000166	.000231	.000308	.000394	5.57
5.58	.000069	.000110	.000163	.000227	.000303	.000388	5.58
5.59	.000067	.000108	.000160	000223	.000298	.000383	5.59
5.60	.000066	.000106	.000157	.000220	.000293	.000377	5.60
5.61	.000065	.000104	.000154	.000216	.000289	.000371	5.61
5.62	.000063	.000101	.000151	.000212	.000284	.000366	5.62
5.63	.000062	.000099	.000148	.000208	.000279	.000360	5.63
5.64	.000060	.000097	.000146	.000205	.000275	.000355	5.64
5.65	.000059	.000096	.000143	.000201	.000271	.000349	5.65
5.66	.000058	.000094	.000140	.000198	.000266	.000344	5.66
5.67	.000057	.000092	.000138	.000195	.000262	.000339	5.67
5.68	.000055	.000090	.000135	.000191	.000258	.000334	5.68
5.69	.000054	.000088	.000133	.000188	.000254	.000329	5.69
5.70	.000053	.000086	.000130	.000185	.000250	.000324	5.70
5.71	.000052	.000084	.000128	.000182	.000246	.000319	5.71
5.72	.000051	.000083	.000125	.000179	.000242	.000314	5.72
5.73	.000050	.000081	.000123	.000175	.000238	.000310	5.73
5.74	.000048	.000080	.000121	.000172	.000234	.000305	5.74
5.75	.000047	.000078	.000119	.000170	.000230	.000300	5.75
5.76	.000046	.000076	.000116	.000167	.000227	.000296	5.76
5.77	.000045	.000075	.000114	.000164	.000223	.000291	5.77
5.78	.000044	.000073	.000112	.000161	.000219	.000287	5.78
5.79	.000043	.000072	.000110	.000158	.000216	.000283	5.79
5.80	.000042	.000071	.000108	.000155	.000212	.000279	5.80
5.81	.000041	.000069	.000106	.000153	.000209	.000274	5.81
5.82	.000041	.000068	.000104	.000150	.000206	.000270	5.82
5.83	.000040	.000066	.000102	.000148	.000202	.000266	5.83
5.84	.000039	.000065	.000100	.000145	.000199	.000262	5.84
5.85	.000038	.000064	.000098	.000143	.000196	.000258	5.85
5.86	.000037	.000062	.000097	.000140	.000193	.000254	5.86
5.87	.000036	.000061	.000095	.000138	.000190	.000250	5.87
5.88	.000035	.000060	.000093	.000135	.000187	.000247	5.88
5.89	.000035	.000059	.000091	.000133	.000184	.000243	5.89
5.90	.000034	.000058	.000090	.000131	.000181	.000239	5.90
5.91	.000033	.000056	.000088	.000128	.000178	.000236	5.91
5.92	.000032	.000055	.000086	.000126	.000175	.000232	5.92
5.93	.000032	.000054	.000085	.000124	.000172	.000229	5.93
5.94	.000031	.000053	.000083	.000122	.000169	.000225	5.94
5.95	.000030	.000052	.000082	.000120	.000167	.000222	5.95
5.96	.000030	.000051	.000080	.000118	.000164	.000218	5.96
5.97	.000029	.000050	.000079	.000116	.000161	.000215	5.97
5.98	.000028	.000049	.000077	.000114	.000159	.000212	5.98
5.99	.000028	.000048	.000076	.000112	.000156	.000209	5.99

t	SKEWNESS						t
	.0	.1	.2	.3	.4	.5	
6.00			.000001	.000002	.000006	.000014	6.00
6.01			.000001	.000002	.000006	.000014	6.01
6.02			.000001	.000002	.000006	.000013	6.02
6.03			.000001	.000002	.000006	.000013	6.03
6.04				.000002	.000005	.000013	6.04
6.05				.000002	.000005	.000012	6.05
6.06				.000002	.000005	.000012	6.06
6.07				.000002	.000005	.000012	6.07
6.08				.000002	.000005	.000011	6.08
6.09				.000002	.000005	.000011	6.09
6.10				.000002	.000005	.000011	6.10
6.11				.000002	.000005	.000011	6.11
6.12				.000001	.000004	.000010	6.12
6.13				.000001	.000004	.000010	6.13
6.14				.000001	.000004	.000010	6.14
6.15				.000001	.000004	.000010	6.15
6.16				.000001	.000004	.000009	6.16
6.17				.000001	.000004	.000009	6.17
6.18				.000001	.000004	.000009	6.18
6.19				.000001	.000004	.000009	6.19
6.20				.000001	.000003	.000008	6.20
6.21				.000001	.000003	.000008	6.21
6.22				.000001	.000003	.000008	6.22
6.23				.000001	.000003	.000008	6.23
6.24				.000001	.000003	.000008	6.24
6.25				.000001	.000003	.000007	6.25
6.26				.000001	.000003	.000007	6.26
6.27				.000001	.000003	.000007	6.27
6.28				.000001	.000003	.000007	6.28
6.29				.000001	.000003	.000007	6.29
6.30				.000001	.000003	.000007	6.30
6.31				.000001	.000003	.000006	6.31
6.32				.000001	.000002	.000006	6.32
6.33				.000001	.000002	.000006	6.33
6.34				.000001	.000002	.000006	6.34
6.35				.000001	.000002	.000006	6.35
6.36				.000001	.000002	.000006	6.36
6.37				.000001	.000002	.000005	6.37
6.38				000001	.000002	.000005	6.38
6.39				.000001	.000002	.000005	6.39
6.40				.000001	.000002	.000005	6.40
6.41				.000001	.000002	.000005	6.41
6.42				.000001	.000002	.000005	6.42
6.43				.000001	.000002	.000005	6.43
6.44				.000001	.000002	.000005	6.44
6.45					.000002	.000004	6.45
6.46					.000002	.000004	6.46
6.47					.000002	.000004	6.47
6.48					.000002	.000004	6.48
6.49					.000002	.000004	6.49

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
6.00	.000027	.000047	.000074	.000110	.000154	.000206	6.00
6.01	.000027	.000046	.000073	000108	.000151	.000202	6.01
6.02	.000026	.000045	.000072	.000106	.000149	.000199	6.02
6.03	.000025	.000044	.000070	.000104	.000146	.000196	6.03
6.04	.000025	.000043	.000069	.000102	.000144	.000193	6.04
6.05	.000024	.000042	.000068	.000101	.000142	.000190	6.05
6.06	.000024	.000041	.000066	.000099	.000139	.000188	6.06
6.07	.000023	.000041	.000065	.000097	.000137	.000185	6.07
6.08	.000023	.000040	.000064	.000096	.000135	.000182	6.08
6.09	.000022	.000039	.000063	.000094	.000133	.000179	6.09
6.10	.000022	.000038	.000062	.000092	.000131	.000176	6.10
6.11	.000021	.000037	.000060	.000091	.000128	.000174	6.11
6.12	.000021	.000037	.000059	.000089	.000126	.000171	6.12
6.13	000020	.000036	.000058	.000088	.000124	.000169	6.13
6.14	000020	.000035	.000057	.000086	.000122	.000166	6.14
6.15	.000019	.000034	.000056	.000085	.000120	.000163	6.15
6.16	.000019	.000034	.000055	.000083	.000118	.000161	6.16
6.17	.000018	.000033	.000054	.000082	.000116	.000159	6.17
6.18	.000018	.000032	.000053	.000080	.000115	.000156	6.18
6.19	.000018	.000032	.000052	.000079	.000113	.000154	6.19
6.20	.000017	.000031	.000051	.000077	.000111	.000151	6.20
6.21	.000017	.000030	.000050	.000076	.000109	.000149	6.21
6.22	.000016	.000030	.000049	.000075	.000107	.000147	6.22
6.23	.000016	.000029	.000048	.000073	.000106	.000145	6.23
6.24	.000016	.000029	.000047	.000072	.000104	.000142	6.24
6.25	.000015	.000028	.000046	.000071	.000102	.000140	6.25
6.26	.000015	.000027	.000045	.000070	.000101	.000138	6.26
6.27	.000015	.000027	.000045	.000068	.000099	.000136	6.27
6.28	.000014	.000026	.000044	.000067	.000097	.000134	6.28
6.29	.000014	.000026	.000043	.000066	.000096	.000132	6.29
6.30	.000014	.000025	.000042	.000065	.000094	.000130	6.30
6.31	.000013	.000025	.000041	.000064	.000093	.000128	6.31
6.32	.000013	.000024	.000041	.000063	.000091	.000126	6.32
6.33	.000013	.000024	.000040	.000062	.000090	.000124	6.33
6.34	.000013	.000023	.000039	.000061	.000088	.000122	6.34
6.35	.000012	.000023	.000038	.000059	.000087	.000120	6.35
6.36	.000012	.000022	.000038	.000058	.000085	.000118	6.36
6.37	.000012	.000022	.000037	.000057	.000084	.000117	6.37
6.38	.000011	.000021	.000036	.000056	.000083	.000115	6.38
6.39	.000011	.000021	.000035	.000055	.000081	.000113	6.39
6.40	.000011	.000021	.000035	.000054	.000080	.000111	6.40
6.41	.000011	.000020	.000034	.000053	.000079	.000110	6.41
6.42	.000010	.000020	.000033	.000053	.000077	.000108	6.42
6.43	.000010	.000019	.000033	.000052	.000076	.000106	6.43
6.44	.000010	.000019	.000032	.000051	.000075	.000105	6.44
6.45	.000010	.000018	.000032	.000050	.000074	.000103	6.45
6.46	.000010	.000018	.000031	.000049	.000072	.000102	6.46
6.47	.000009	.000018	.000030	.000048	.000071	.000100	6.47
6.48	.000009	.000017	.000030	.000047	.000070	.000099	6.48
6.49	.000009	.000017	.000029	.000046	.000069	.000097	6.49

t	SKEWNESS .0	.1	.2	.3	.4	.5	t
6.50					.000001	.000004	6.50
6.51					.000001	.000004	6.51
6.52					.000001	.000004	6.52
6.53					.000001	.000004	6.53
6.54					.000001	.000004	6.54
6.55					.000001	.000003	6.55
6.56					.000001	.000003	6.56
6.57					.000001	.000003	6.57
6.58					.000001	.000003	6.58
6.59					.000001	.000003	6.59
6.60					.000001	.000003	6.60
6.61					.000001	.000003	6.61
6.62					.000001	.000003	6.62
6.63					.000001	.000003	6.63
6.64					.000001	.000003	6.64
6.65					.000001	.000003	6.65
6.66					.000001	.000003	6.66
6.67					.000001	.000003	6.67
6.68					.000001	.000002	6.68
6.69					.000001	.000002	6.69
6.70					.000001	.000002	6.70
6.71					.000001	.000002	6.71
6.72					.000001	.000002	6.72
6.73					.000001	.000002	6.73
6.74					.000001	.000002	6.74
6.75					.000001	.000002	6.75
6.76					.000001	.000002	6.76
6.77					.000001	.000002	6.77
6.78					.000001	.000002	6.78
6.79					.000001	.000002	6.79
6.80					.000001	.000002	6.80
6.81					.000001	.000002	6.81
6.82					.000001	.000002	6.82
6.83					.000001	.000002	6.83
6.84					.000001	.000002	6.84
6.85					.000001	.000002	6.85
6.86					.000001	.000002	6.86
6.87						.000002	6.87
6.88						.000001	6.88
6.89						.000001	6.89
6.90						.000001	6.90
6.91						.000001	6.91
6.92						.000001	6.92
6.93						.000001	6.93
6.94						.000001	6.94
6.95						.000001	6.95
6.96						.000001	6.96
6.97						.000001	6.97
6.98						.000001	6.98
6.99						.000001	6.99

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
6.50	.000009	.000017	.000029	.000046	.000068	.000096	6.50
6.51	.000008	.000016	.000028	.000045	.000067	.000094	6.51
6.52	.000008	.000016	.000028	.000044	.000066	.000093	6.52
6.53	.000008	.000016	.000027	.000043	.000065	.000091	6.53
6.54	.000008	.000015	.000027	.000042	.000063	.000090	6.54
6.55	.000008	.000015	.000026	.000042	.000062	.000088	6.55
6.56	.000008	.000015	.000026	.000041	.000061	.000087	6.56
6.57	.000007	.000014	.000025	.000040	.000060	.000086	6.57
6.58	.000007	.000014	.000025	.000040	.000059	.000084	6.58
6.59	.000007	.000014	.000024	.000039	.000058	.000083	6.59
6.60	.000007	.000014	.000024	.000038	.000057	.000082	6.60
6.61	.000007	.000013	.000023	.000038	.000057	.000081	6.61
6.62	.000007	.000013	.000023	.000037	.000056	.000079	6.62
6.63	.000006	.000013	.000022	.000036	.000055	.000078	6.63
6.64	.000006	.000012	.000022	.000036	.000054	.000077	6.64
6.65	.000006	.000012	.000022	.000035	.000053	.000076	6.65
6.66	.000006	.000012	.000021	.000034	.000052	.000075	6.66
6.67	.000006	.000012	.000021	.000034	.000051	.000073	6.67
6.68	.000006	.000011	.000020	.000033	.000050	.000072	6.68
6.69	.000006	.000011	.000020	.000033	.000050	.000071	6.69
6.70	.000005	.000011	.000020	.000032	.000049	.000070	6.70
6.71	.000005	.000011	.000019	.000031	.000048	.000069	6.71
6.72	.000005	.000010	.000019	.000031	.000047	.000068	6.72
6.73	.000005	.000010	.000018	.000030	.000046	.000067	6.73
6.74	.000005	.000010	.000018	.000030	.000046	.000066	6.74
6.75	.000005	.000010	.000018	.000029	.000045	.000065	6.75
6.76	.000005	.000010	.000017	.000029	.000044	.000064	6.76
6.77	.000005	.000009	.000017	.000028	.000043	.000063	6.77
6.78	.000005	.000009	.000017	.000028	.000043	.000062	6.78
6.79	.000004	.000009	.000016	.000027	.000042	.000061	6.79
6.80	.000004	.000009	.000016	.000027	.000041	.000060	6.80
6.81	.000004	.000009	.000016	.000026	.000041	.000059	6.81
6.82	.000004	.000008	.000016	.000026	.000040	.000058	6.82
6.83	.000004	.000008	.000015	.000025	.000039	.000057	6.83
6.84	.000004	.000008	.000015	.000025	.000039	.000056	6.84
6.85	.000004	.000008	.000015	.000024	.000038	.000056	6.85
6.86	.000004	.000008	.000014	.000024	.000037	.000055	6.86
6.87	.000004	.000008	.000014	.000024	.000037	.000054	6.87
6.88	.000004	.000007	.000014	.000023	.000036	.000053	6.88
6.89	.000004	.000007	.000014	.000023	.000036	.000052	6.89
6.90	.000003	.000007	.000013	.000022	.000035	.000051	6.90
6.91	.000003	.000007	.000013	.000022	.000034	.000051	6.91
6.92	.000003	.000007	.000013	.000022	.000034	.000050	6.92
6.93	.000003	.000007	.000013	.000021	.000033	.000049	6.93
6.94	.000003	.000007	.000012	.000021	.000033	.000048	6.94
6.95	.000003	.000006	.000012	.000020	.000032	.000048	6.95
6.96	.000003	.000006	.000012	.000020	.000032	.000047	6.96
6.97	.000003	.000006	.000012	.000020	.000031	.000046	6.97
6.98	.000003	.000006	.000011	.000019	.000031	.000045	6.98
6.99	.000003	.000006	.000011	.000019	.000030	.000045	6.99

t	SKEWNESS .0	.1	.2	.3	.4	.5	t
7.00						.000001	7.00
7.01						.000001	7.01
7.02						.000001	7.02
7.03						.000001	7.03
7.04						.000001	7.04
7.05						.000001	7.05
7.06						.000001	7.06
7.07						.000001	7.07
7.08						.000001	7.08
7.09						.000001	7.09
7.10						.000001	7.10
7.11						.000001	7.11
7.12						.000001	7.12
7.13						.000001	7.13
7.14						.000001	7.14
7.15						.000001	7.15
7.16						.000001	7.16
7.17						.000001	7.17
7.18						.000001	7.18
7.19						.000001	7.19
7.20						.000001	7.20
7.21						.000001	7.21
7.22						.000001	7.22
7.23						.000001	7.23
7.24						.000001	7.24
7.25						.000001	7.25
7.26						.000001	7.26
7.27						.000001	7.27
7.28						.000001	7.28
7.29							7.29
7.30							7.30
7.31							7.31
7.32							7.32
7.33							7.33
7.34							7.34
7.35							7.35
7.36							7.36
7.37							7.37
7.38							7.38
7.39							7.39
7.40							7.40
7.41							7.41
7.42							7.42
7.43							7.43
7.44							7.44
7.45							7.45
7.46							7.46
7.47							7.47
7.48							7.48
7.49							7.49

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
7.00	.000003	.000006	.000011	.000019	.000030	.000044	7.00
7.01	.000003	.000006	.000011	.000018	.000029	.000043	7.01
7.02	.000003	.000006	.000011	.000018	.000029	.000043	7.02
7.03	.000003	.000005	.000010	.000018	.000028	.000042	7.03
7.04	.000002	.000005	.000010	.000017	.000028	.000041	7.04
7.05	.000002	.000005	.000010	.000017	.000027	.000041	7.05
7.06	.000002	.000005	.000010	.000017	.000027	.000040	7.06
7.07	.000002	.000005	.000010	.000016	.000026	.000039	7.07
7.08	.000002	.000005	.000009	.000016	.000026	.000039	7.08
7.09	.000002	.000005	.000009	.000016	.000025	.000038	7.09
7.10	.000002	.000005	.000009	.000016	.000025	.000038	7.10
7.11	.000002	.000005	.000009	.000015	.000025	.000037	7.11
7.12	.000002	.000004	.000009	.000015	.000024	.000037	7.12
7.13	.000002	.000004	.000008	.000015	.000024	.000036	7.13
7.14	.000002	.000004	.000008	.000015	.000023	.000035	7.14
7.15	.000002	.000004	.000008	.000014	.000023	.000035	7.15
7.16	.000002	.000004	.000008	.000014	.000023	.000034	7.16
7.17	.000002	.000004	.000008	.000014	.000022	.000034	7.17
7.18	.000002	.000004	.000008	.000014	.000022	.000033	7.18
7.19	.000002	.000004	.000008	.000013	.000022	.000033	7.19
7.20	.000002	.000004	.000007	.000013	.000021	.000032	7.20
7.21	.000002	.000004	.000007	.000013	.000021	.000032	7.21
7.22	.000002	.000004	.000007	.000013	.000021	.000031	7.22
7.23	.000002	.000004	.000007	.000012	.000020	.000031	7.23
7.24	.000002	.000003	.000007	.000012	.000020	.000030	7.24
7.25	.000001	.000003	.000007	.000012	.000019	.000030	7.25
7.26	.000001	.000003	.000007	.000012	.000019	.000029	7.26
7.27	.000001	.000003	.000006	.000012	.000019	.000029	7.27
7.28	.000001	.000003	.000006	.000011	.000019	.000028	7.28
7.29	.000001	.000003	.000006	.000011	.000018	.000028	7.29
7.30	.000001	.000003	.000006	.000011	.000018	.000028	7.30
7.31	.000001	.000003	.000006	.000011	.000018	.000027	7.31
7.32	.000001	.000003	.000006	.000011	.000017	.000027	7.32
7.33	.000001	.000003	.000006	.000010	.000017	.000026	7.33
7.34	.000001	.000003	.000006	.000010	.000017	.000026	7.34
7.35	.000001	.000003	.000006	.000010	.000016	.000025	7.35
7.36	.000001	.000003	.000005	.000010	.000016	.000025	7.36
7.37	.000001	.000003	.000005	.000010	.000016	.000025	7.37
7.38	.000001	.000003	.000005	.000009	.000016	.000024	7.38
7.39	.000001	.000003	.000005	.000009	.000015	.000024	7.39
7.40	.000001	.000002	.000005	.000009	.000015	.000024	7.40
7.41	.000001	.000002	.000005	.000009	.000015	.000023	7.41
7.42	.000001	.000002	.000005	.000009	.000015	.000023	7.42
7.43	.000001	.000002	.000005	.000009	.000014	.000022	7.43
7.44	.000001	.000002	.000005	.000008	.000014	.000022	7.44
7.45	.000001	.000002	.000005	.000008	.000014	.000022	7.45
7.46	.000001	.000002	.000004	.000008	.000014	.000021	7.46
7.47	.000001	.000002	.000004	.000008	.000013	.000021	7.47
7.48	.000001	.000002	.000004	.000008	.000013	.000021	7.48
7.49	.000001	.000002	.000004	.000008	.000013	.000020	7.49

t	SKEWNESS						t
	.0	.1	.2	.3	4	.5	
7.50							7.50
7.51							7.51
7.52							7.52
7.53							7.53
7.54							7.54
7.55							7.55
7.56							7.56
7.57							7.57
7.58							7.58
7.59							7.59
7.60							7.60
7.61							7.61
7.62							7.62
7.63							7.63
7.64							7.64
7.65							7.65
7.66							7.66
7.67							7.67
7.68							7.68
7.69							7.69
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t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
7.50	.000001	.000002	.000004	.000008	.000013	.000020	7.50
7.51	.000001	.000002	.000004	.000007	.000013	.000020	7.51
7.52	.000001	.000002	.000004	.000007	.000012	.000020	7.52
7.53	.000001	.000002	.000004	.000007	.000012	.000019	7.53
7.54	.000001	.000002	.000004	.000007	.000012	.000019	7.54
7.55	.000001	.000002	.000004	.000007	.000012	.000019	7.55
7.56	.000001	.000002	.000004	.000007	.000012	.000018	7.56
7.57	.000001	.000002	.000004	.000007	.000011	.000018	7.57
7.58	.000001	.000002	.000004	.000007	.000011	.000018	7.58
7.59	.000001	.000002	.000003	.000006	.000011	.000017	7.59
7.60	.000001	.000002	.000003	.000006	.000011	.000017	7.60
7.61	.000001	.000002	.000003	.000006	.000011	.000017	7.61
7.62	.000001	.000002	.000003	.000006	.000010	.000017	7.62
7.63	.000001	.000001	.000003	.000006	.000010	.000016	7.63
7.64	.000001	.000001	.000003	.000006	.000010	.000016	7.64
7.65	.000001	.000001	.000003	.000006	.000010	.000016	7.65
7.66	.000001	.000001	.000003	.000006	.000010	.000016	7.66
7.67	.000001	.000001	.000003	.000006	.000010	.000015	7.67
7.68	.000001	.000001	.000003	.000005	.000009	.000015	7.68
7.69	.000001	.000001	.000003	000005	.000009	.000015	7.69
7.70	.000001	.000001	.000003	.000005	.000009	.000015	7.70
7.71		.000001	.000003	.000005	.000009	.000014	7.71
7.72		.000001	.000003	.000005	.000009	.000014	7.72
7.73		.000001	.000003	.000005	.000009	.000014	7.73
7.74		.000001	.000003	.000005	.009009	.000014	7.74
7.75		.000001	.000002	.000005	.000008	.000014	7.75
7.76		.000001	.000002	.000005	.000008	.000013	7.76
7.77		.000001	.000002	.000005	.000008	.000013	7.77
7.78		.000001	.000002	.000005	.000008	.000013	7.78
7.79		.000001	.000002	.000004	.000008	.000013	7.79
7.80		.000001	.000002	.000004	.000008	.000013	7.80
7.81		.000001	.000002	.000004	.000008	.000012	7.81
7.82		.000001	.000002	.000004	.000007	.000012	7.82
7.83		.000001	.000002	.000004	.000007	.000012	7.83
7.84		.000001	.000002	.000004	.000007	.000012	7.84
7.85		.000001	.000002	.000004	.000007	.000012	7.85
7.86		.000001	.000002	.000004	.000007	.000011	7.86
7.87		.000001	.000002	.000004	.000007	.000011	7.87
7.88		.000001	.000002	.000004	.000007	.000011	7.88
7.89		.000001	.000002	.000004	.000007	.000011	7.89
7.90		.000001	.000002	.000004	.000007	.000011	7.90
7.91		.000001	.000002	.000004	.000006	.000011	7.91
7.92		.000001	.000002	.000004	.000006	.000010	7.92
7.93		.000001	.000002	.000003	.000006	.000010	7.93
7.94		.000001	.000002	.000003	.000006	.000010	7.94
7.95		.000001	.000002	.000003	.000006	.000010	7.95
7.96		.000001	.000002	.000003	.000006	.000010	7.96
7.97		.000001	.000002	.000003	.000006	.000010	7.97
7.98		.000001	.000002	.000003	.000006	.000009	7.98
7.99		.000001	.000002	.000003	.000006	.000009	7.99

t	SKEWNESS						t
	.0	.1	.2	.3	.4	.5	
8.00							8.00
8.01							8.01
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t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
8.00		.000001	.000002	.000003	.000005	.000009	8.00
8.01		.000001	.000001	.000003	.000005	.000009	8.01
8.02		.000001	.000001	.000003	.000005	.000009	8.02
8.03		.000001	.000001	.000003	.000005	.000009	8.03
8.04		.000001	.000001	.000003	.000005	.000009	8.04
8.05		.000001	.000001	.000053	.000005	.000008	8.05
8.06		.000001	.000001	.000003	.000005	.000008	8.06
8.07		.000001	.000001	.000003	.000005	.000008	8.07
8.08		.000001	.000001	.000003	.000005	.000008	8.08
8.09		.000001	.000001	.000003	.000005	.000008	8.09
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8.11		.000001	.000001	.000002	.000005	.000008	8.11
8.12		.000001	.000001	.000002	.000004	.000008	8.12
8.13			.000001	.000002	.000004	.000007	8.13
8.14			.000001	.000002	.000004	.000007	8.14
8.15			.000001	.000002	.000004	.000007	8.15
8.16			.000001	.000002	.000004	.000007	8.16
8.17			.000001	.000002	.000004	.000007	8.17
8.18			.000001	.000002	.000004	.000007	8.18
8.19			.000001	.000002	.000004	.000007	8.19
8.20			.000001	.000002	.000004	.000007	8.20
8.21			.000001	.000002	.000004	.000007	8.21
8.22			.000001	.000002	.000004	.000006	8.22
8.23			.000001	000002	.000004	.000006	8.23
8.24			.000001	000002	.000004	.000006	8.24
8.25			.000001	000002	.000004	.000006	8.25
8.26			.000001	000002	.000004	.000006	8.26
8.27			.000001	000002	.000003	.000006	8.27
8.28			.000001	.000002	.000003	.000006	8.28
8.29			.000001	000002	.000003	.000006	8.29
8.30			.000001	000002	.000003	.000006	8.30
8.31			.000001	000002	.000003	.000006	8.31
8.32			.000001	000002	.000003	.000006	8.32
8.33			.000001	.000002	.000003	.000005	8.33
8.34			.000001	.000002	.000003	.000005	8.34
8.35			.000001	.000002	.000003	.000005	8.35
8.36			.000001	.000002	.000003	.000005	8.36
8.37			.000001	.000002	.000003	.000005	8.37
8.38			000001	.000002	000003	.000005	8.38
8.39			000001	.000001	000003	.000005	8.39
8.40			000001	000001	000003	.000005	8.40
8.41			.000001	.000001	.000003	.000005	8.41
8.42			.000001	.000001	.000003	.000005	8.42
8.43			.000001	.000001	.000003	.000005	8.43
8.44			.000001	.000001	.000003	.000005	8.44
8.45			.000001	.000001	000003	.000004	8.45
8.46			.000001	000001	.000003	.000004	8.46
8.47			.000001	.000001	.000002	.000004	8.47
8.48			.000001	.000001	000002	.000004	8.48
8.49			.000001	.000001	.000002	.000004	8.49

t	SKEWNESS						t
	.0	.1	.2	.3	.4	.5	
8.50							8.50
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t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
8.50			.000001	.000001	.000002	.000004	8.50
8.51			.000001	.000001	.000002	.000004	8.51
8.52			.000001	.000001	.000002	.000004	8.52
8.53			.000001	.000001	.000002	.000004	8.53
8.54			.000001	.000001	.000002	.000004	8.54
8.55			.000001	.000001	.000002	.000004	8.55
8.56				.000001	.000002	.000004	8.56
8.57				.000001	.000002	.000004	8.57
8.58				.000001	.000002	.000004	8.58
8.59				.000001	.000002	.000004	8.59
8.60				.000001	.000002	.000004	8.60
8.61				.000001	.000002	.000003	8.61
8.62				.000001	.000002	.000003	8.62
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8.64				.000001	.000002	.000003	8.64
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8.66				.000001	.000002	.000003	8.66
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8.69				.000001	.000002	.000003	8.69
8.70				.000001	.000002	.000003	8.70
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8.72				.000001	.000002	.000003	8.72
8.73				.000001	.000002	.000003	8.73
8.74				.000001	.000002	.000003	8.74
8.75				.000001	.000002	.000003	8.75
8.76				.000001	.000001	.000003	8.76
8.77				.000001	.000001	.000003	8.77
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8.80				.000001	.000001	.000003	8.80
8.81				.000001	.000001	.000003	8.81
8.82				.000001	.000001	.000002	8.82
8.83				.000001	.000001	.000002	8.83
8.84				.000001	.000001	.000002	8.84
8.85				.000001	.000001	.000002	8.85
8.86				.000001	.000001	.000002	8.86
8.87				.000001	.000001	.000002	8.87
8.88				.000001	.000001	.000002	8.88
8.89				.000001	.000001	.000002	8.89
8.90				.000001	.000001	.000002	8.90
8.91				.000001	.000001	.000002	8.91
8.92				.000001	.000001	.000002	8.92
8.93				.000001	.000001	.000002	8.93
8.94				.000001	.000001	.000002	8.94
8.95				.000001	.000001	.000002	8.95
8.96				.000001	.000001	.000002	8.96
8.97				.000001	.000001	.000002	8.97
8.98					.000001	.000002	8.98
8.99							8.99

t	SKEWNESS						t
	.0	.1	.2	.3	.4	.5	
9.00							9.00
9.01							9.01
9.02							9.02
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9.48							9.48
9.49							9.49

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
9.00					.000001	.000002	9.00
9.01					.000001	.000002	9.01
9.02					.000001	.000002	9.02
9.03					.000001	.000002	9.03
9.04					.000001	.000002	9.04
9.05					.000001	.000002	9.05
9.06					.000001	.000002	9.06
9.07					.000001	.000002	9.07
9.08					.000001	.000002	9.08
9.09							9.09
					.000001	.000002	
9.10					.000001	.000002	9.10
9.11					.000001	.000002	9.11
9.12					.000001	.000002	9.12
9.13					.000001	.000001	9.13
9.14					.000001	.000001	9.14
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					.000001	.000001	
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9.38					.000001	.000001	9.38
9.39							9.39
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9.40						.000001	9.40
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944						.000001	9.44
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9.46						.000001	9.46
9.47						.000001	9.47
9.48						.000001	9.48
9.49							9.49

t	SKEWNESS .0	.1	.2	.3	.4	.5	t
9.50							9.50
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9.99							9.99

t	SKEWNESS						t
	.6	.7	.8	.9	1.0	1.1	
9.50						.000001	9.50
9.51						.000001	9.51
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